



SATURDAY, NOVEMBER 29, 1873.

Contributions.

Accidents Prevented by Safety Chains.

Since the publication of the report of the Committee of the Master Mechanics' Association on Safety Chains and our editorial comments on the same, we have received the following accounts of accidents which were prevented by safety chains. We earnestly invite all experienced railroad men to send us similar accounts for publication. Those who are more accustomed to handling a throttle lever than to "writing for the papers," or have more practice in punching tickets than in punctuating sentences, are especially requested not to mind about the rules of grammar or the laws of rhetoric, but send us the facts and we will put them in shape for the printer and the public.

CINCINNATI, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

On the night of July 1, during a very heavy rain storm, a culvert near Colfax, Ind., on the Indianapolis, Cincinnati & Lafayette Railroad, was washed out and the walls were undermined and settled, causing a depression in the track. The train, which was said to be moving at the rate of 35 miles per hour, consisted of a baggage car, two coaches and two sleeping cars, all went over safely, but the rear truck of the tender "jumped the track" about ten yards from the culvert, and in doing so disconnected the hose of the air brake, and the train ran about 600 yards, coming to a road-crossing cattle guard which was walled up. Here the safety chains gave way, I suppose on account of the truck dropping partly down between the walls, and it went to pieces and under the baggage car, turning it into the ditch, but not injuring any other part of the train, as the speed had then been greatly reduced.

I noted that about 20 yards from the place the truck left the rails, it had run more than two feet from them, and the safety chains guided it back again. It was an iron truck, and the box-bolts in the corner were also eye-bolts for safety chains. These bolts broke under the heads and let the trucks go to pieces.

W.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Having read with a good deal of interest the report of the Committee of the Master Mechanics' Association on Safety Chains, I thought I would write and inform you of what would have been a bad accident on the Troy & Greenfield Railroad last summer, had it not been for the safety chains. A passenger train was running about 35 miles per hour, when the forward truck wheels of the engine left the track and ran 910 feet before the train was stopped. She ran 670 feet on a 6-degree curve and 240 feet on a straight line, doing no damage. Had the chains broken the engine and train would have gone down the embankment.

WM. A. FOSTER,

Locomotive Engineer, Fitchburg, Mass.

COLUMBIA, Tenn., November 17, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As a subscriber and constant reader of your valuable paper, I have been very much pleased with your articles on check or safety chains. I know of several instances where they have been the means of saving serious accidents.

I was on a train a short time since, and an axle broke under tender. Nothing left the rails except the truck. With broken axle we ran half a mile before the train was stopped, and found the safety chains holding the truck up from ties. There is no doubt if chains had not been there, the truck would have been knocked from under tender and have thrown some other part of train from the track. Every truck should have them. If they did, the damage to cars leaving the track would be very light to what it is now. You would find fewer of them turned over on their sides alongside the track. I have had some experience with trucks, and find that as long as trucks do not turn crosswise of the track the damage is not so much to them as if they do; besides, your axles are not so liable to bend. I hope that every road in the country will see the importance of adopting them at an early day.

Yours truly,

J. T. H.

Can our Railroads afford to Kill 328 Persons Annually, to say Nothing of 1,326 Persons Injured?

TO THE EDITOR OF THE RAILROAD GAZETTE:

As one of the 40,000,000 of Americans from whom the railroads select their victims, I have always been very much interested in the columns of reported railway accidents. (There ought to be a law compelling, under a heavy penalty for neglect, every railroad to furnish an accurate report of every accident.) Your figures for last year are as follows: Killed, 328; injured, 1,326.

I have asked whether railroads can afford to do this kind of work. Let us see. I believe in our State \$5,000 is the legal limit, though I see that the Indianapolis & St. Louis road had to pay \$8,000 for hurting Mr. Horst, and he was riding on a free pass.

Killed—328 at \$5,000.....\$1,640,000
Injured—328 at say \$500.....683,000

Total.....\$2,323,000

Here we have upward of two millions and a quarter of dollars—to say nothing of machinery wrecked and ruined; nor

to mention again that more than three hundred men have been killed and upward of a thousand maimed.

If these pecuniary losses were divided among the railroads of the United States would it not make a pretty heavy bill of expenses?

Can they afford it? Can we?

J. B. BITTINGER.

Long Runs.

TO THE EDITOR OF THE RAILROAD GAZETTE:

If, as the Committee of the Master Mechanics find, an engine wears her tires to the amount of one-sixteenth of an inch for 16,000 miles, what must be the condition of tires on the engine "Joe" run, after having run the 134,103 miles? It is sometimes well to tell a good story, but on our road the tires would have double changes long before running 100,000 miles, that is, if the engine performed any duty. If we get 50,000 miles without turning tires, we think it an extraordinary run.

H. J. McKENNA.

Rail Joints.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Will some of your practical readers give me the benefit of their observation on the two kinds of "fish joint," "suspended" (ties 10 inches apart) and "joint on tie," stating which they have found the best and the easiest to keep up; also, the conditions as to road-bed, ballast and estimated amount of traffic, under which their observations were made.

CLEVELAND, O., November 14, 1873.

M.

Winslow's Nut Lock.

The engraving herewith represents a recently patented device for preventing the nuts of fish-plate and car-truck bolts from turning off, owing to the continued jarring to which they are subjected. This invention consists of a volute conical spring formed of spring wire placed upon the bolt, followed by a friction washer, both being brought to their place by turn-



Fig. 1.

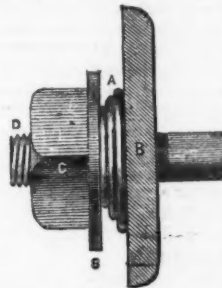


Fig. 2.

ing the nut firmly against them. Fig. 1 represents the volute spring; fig. 2, letter B, the fish-plate, A the spring compressed by the nut, S the friction washer, D the bolt, and C the nut partly screwed up. The spring has a resisting force of more than fifty pounds, hence the impossibility of the nuts turning back.

This device, it is said, has been applied on several different roads, and is working satisfactorily. The inventor will furnish springs for trial without any charge, and will give any information desired. His address is L. Winslow, Rochester, New York.

Mr. Kingsbury's "New Style of Coupon Tickets."

NEW YORK, November 15, 1873.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I was delighted to see that your journal had opened its columns to the General Ticket Department for the discussion of matters relating to the passenger business of this country. As you remark, "there is scarcely any department of railroad business in which there are so many opportunities for experiment, discussion and perhaps reform."

The general ticket and passenger agents have never had an opportunity to ventilate their views through the press, and very little chance to exchange notes on the systems now in vogue, even. At their semi-annual meetings the time is so taken up with passenger rates and kindred subjects that no chance is given them to discuss reforms in the system or anything else.

We as a department are out in the cold, so to speak, and the car builders, master mechanics and, in fact, every other department have journals or a column devoted to their peculiar branch of the business. It is indeed astonishing to me that a passenger journal was not established before now, as it would be warmly supported by the profession.

Your journal is circulated largely among, and read with interest by, the general ticket agents, and I have no doubt but that the discussion of their views will increase the circulation. So please stick to your intention of giving us a little room in your paper.

Now, a few words about Mr. Kingsbury's article in the number of November 1.

There are some serious objections to the adoption of the form of ticket he mentions. You cannot call it economical, when it opens so many loopholes for fraud, nor do I see that it reduces the cost of our fitting a station. You will notice in the form given that the agent has to write the name Oakland in the ticket five times; now, to do that legibly with ink requires time, and as a general thing the agent does not have very much of that article when the train is waiting or approaching a station.

Again, by a chemical, for sale in all book-stores, the name Oakland can be erased and some other name substituted, thus defrauding the road.

Again, it upsets the consecutive numbered system, (the base of the ticket system, and the check on the agent.)

I have found by long experience that the less you require an agent to do the better you get your work done; and to require an agent to write in the names of stations on a long five-coupon ticket, while a string of passengers are at the window asking for other tickets, is too much for good nature.

There can be no claim made that the ticket is a new idea; for it was used on the Catawissa road years ago, and abandoned on the ground that there were more errors made than would pay for the cost of stocking a station with straight coupon tickets.

It is now, I think, used on that "pseudomite road," the Grand Trunk, on which road can be seen the crudest ideas of tickets in the known world.

But I have taken up too much of your valuable space already. If consistent, I will offer some of my views at another time about reform in the ticket system.

O. B. JOYFUL, G. T. A.

[We beg leave to say that if the ticket and passenger department has not made itself frequently visible in our columns, it has been chiefly its own fault; for we have always had a place for it, as for all other branches of railroad business. We need not say that we shall be glad to present further views from this correspondent.—EDITOR RAILROAD GAZETTE.]

Interchange of Freight Cars.

TO THE EDITOR OF THE RAILROAD GAZETTE:

This is one of the subjects that the Railway Association of America took in hand some time ago; but as yet the problem has not been solved, nor has any practical suggestion been made. Is reform necessary? In order to answer this we must review the practice now obtaining, and the rules governing it. The first railroads built were designed for local purposes only and for a period remained isolated. After a time roads were built to connect certain of those isolated lines and to do what is known as "a through business." Then, to save time and cost of handling, arrangements were made to run cars of each road over the others when loaded with "through freight." The interchange was not very great, the length of run was short, compared with the through runs of to-day, and in the business mutual accommodation was expected; each road understanding that the use of its cars would be repaid in kind. Under such circumstances the mileage basis was adopted for settlement between the roads, and for a time it worked fairly enough; but now, with 60,000 miles of railroad, more or less connected, and with some of the roads crowded with traffic and with keener competition among traders, the evils of the mileage system are making themselves felt. Or perhaps we should not say the evils of the mileage basis, but rather the incompleteness of the system. Mileage is well enough as a basis of settlement, because it fixes a minimum charge for the use of the car, proportioned to the amount received for hauling its contents; but it should be qualified by time. The number of cars daily passing to and fro between the various railroads of the United States is very large, and yet there is no written code regulating the interchange, and no uniformity of rates; the questions continually arising in the business are either put aside unsettled or are adjusted by the parties immediately concerned in a rough and ready way, pretty often on the principle that "might is right." The fact that there is no general code is not creditable to the railroad managers, and the sooner they set about the work of drawing one up the better. The interchange of cars is now a necessity which can never be avoided in the transportation of products of the field, the forest and the mine; the refusal of a road to interchange might be suicidal. Under such circumstances, with no recognized law, injustice must often be done.

The general principles which should govern the interchange of cars may be stated thus:

1st. Foreign cars should be returned to the home road as quickly as possible.

2d. Foreign cars, after being unloaded, should not be used by any road for any purpose except that of carrying a load home, or in the direction of home.

3d. The owner should receive remuneration for the loss of use of his car in proportion to the time he is deprived of its use.

These are the principles which are supposed to regulate the interchange now; unfortunately the practice does not accord with the theory. In the first place, as there is no penalty for wrong-doing, and as the owner receives the same allowance—viz., the mileage rate—whether his car be gone two days or two weeks or two months, if an intermediate road uses a foreign car locally or sends it in a wrong direction, the owner must wait patiently for the return of his car and pocket the loss.

As there is no penalty, there is no means of enforcing obedience to any rules that may be agreed on. For example, the first principle is that "cars should be returned to the home road as quickly as possible." Who is to judge of this? The owner may complain of delay. The managers of the other roads declare, each one, that the car was passed over his road "as quickly as possible." Against such declarations the complainant has no appeal; a refusal to interchange might be ruinous. Consequently, in the present order of things, the road that runs its trains at a slow speed and that from economical motives keeps its rolling stock and working staff at a low figure has a decided but unfair advantage over those roads which are compelled, by their position and the nature of their traffic, to supply rolling stock and to keep an efficient staff. Again: the owner has no means of keeping track of the car and its movements after it passes off the home road. When the car is loaded from a station on one line to a station on another immediately connecting, not so much difficulty is

experienced in keeping control over it: but when it has to pass over two or three or more roads after it leaves its own, the home road loses all control over the car, and must wait patiently until it returns and be content with receiving a fixed sum (mileage) whether the car be gone six days or six weeks. The theory of the present practice is that each road holds itself responsible to the one from which it received the car for the roads beyond it, and thus a chain of responsibility is established from the home road to the destination; but it needs scarce a moment's thought to understand the weakness of this chain of responsibility, and as the strength of a chain is measured by its weakest link, so an ill-organized or unscrupulous road may work much wrong to many roads both near and remote. Suppose A, B, C, D, the four roads over which a car has passed and has not been returned in due time. A inquires of B, and B of C, but D disputes with C and refuses to acknowledge any responsibility for the car. A cannot hold B for the value of the car, nor for demurrage; C and D are remote roads and deny their responsibility. What can A do? Under the present system it can do nothing at all; in fact, the present system places the good at the mercy of the bad; the only advantage gained by a road that hurries foreign cars along is the clearing of its sidings; for reciprocity in that line must not be expected. The car is not always returned by the route it traveled over first, so that not only is the owner deprived of the use of his car a longer time than he should be, but the chain of responsibility is destroyed, and occasionally a road hauls over its length a foreign car without receiving any consideration whatever. A large proportion of foreign cars are loaded and unloaded by shippers and consignees, who, if not looked after carefully, keep the cars much longer than necessary.

That miserable scarecrow yclept "competition," which frightens away the senses of so many railroad men, is frequently pleaded as the cause for long suffering on the part of railroad companies in this respect; but if truth were sought for, the revelation would be that the regard of a station agent for his personal popularity and benefit has more to do with forbearance toward consignees than any necessity induced by competition. Demurrage on foreign cars is probably not collected so promptly as on local ones, and when collected it does not always go to the owner of the car, to whom it rightly belongs.

During times of local pressure there is strong temptation to use foreign cars improperly, which temptation is not always resisted. Sometimes from sheer carelessness of station hands and neglect of yardmen foreign cars are used locally or sent in a wrong direction. In such cases, although no culpability may directly attach to the officials of the road, it is only fair that the owner of the car be compensated for the loss of its use.

The car on arriving at its original destination is sometimes billed forward, the forwarding road taking credit for the additional mileage, which should of course go to the owner.

Cars have stayed away from their owners, frequently for months and have returned almost worn out; not a few have gone never to be heard of again by their owners; some have been found by special messengers, in work trains; some have been broken up in wrecks and not paid for although the debt is not denied; in one case that I know of, a foreign car lay more than a month under load because of a dispute between the consignee and the delivering road; in another case, several foreign cars ran into a lake and spite of the remonstrances of the owner, who wanted them badly, they were allowed to lie for months. In addition to all these abuses, there is the constant one of excessive detention on the journey and at destination.

The knocking about in yards and the damage resulting therefrom must not be lost sight of. I doubt if it is an exaggeration to say that, hour for hour, a car is subject to more wear and tear while on station sidings than when running on the main line.

Few roads, I imagine, have made calculations as to the cost of these delays to them. A feeling of despair has grown up which has engendered recklessness, and managers are more or less content to let these things regulate themselves, on the principle that "if my neighbors keep my cars I shall keep theirs;" but one road that I know of calculated its loss during the three months of December, January and February last, with the following result: 1,300 cars passed off the road; after allowing 24 hours for every hundred miles' journey and two days at destination, it was found that the detention in excess of this very liberal allowance, amounted during the three months to 22,400 days, or an average of 17 3-13 days' unnecessary detention to each car.

There were no blockaded rivers or obstructions from natural causes in the territory through which these cars ran, so that no valid excuse could be given; the fact was that the cars, instead of being returned promptly, were used in local and opposition business. In one part of the country it is notorious that one of two rival roads detains its rival's cars as long as possible, whenever it can get hold of them, and frequently ships them off to a distant point where they are used in local business.

Now the questions to be considered are: "Is reform necessary?" and "What system is best?" If the first question were put to all the managers in the country, in spite of all the evils we have enumerated—which not a railroad man of experience will deny, or even claim to be exaggerations—quite a number would reply that they are satisfied with the present system. All roads, poorly stocked or badly managed are very well content with paying mileage; it is so much cheaper than building cars or hiring them from rolling-stock companies, and it is such a comfort to know that whether your employees are active and intelligent or not, and whether your locomotive power is sufficient or not, the worst inconvenience you will be subjected to is the filling of your sidings with cars; then, too, when you have been unfortunate enough to smash up a dozen

cars or so, it is convenient to be able to immediately replace them with somebody else's, and if the owner of the debris asks for the value of his cars, you can either turn a deaf ear or tell him to wait until you build him some new ones, which of course you cannot do until your financial prospects brighten (only you don't tell him so). Also there is a great advantage in using other people's cars when your road-bed is defective; by and by, when you get more money and improve your road, you can build your own cars. Then, of course, if your local traffic is dull, rather than let your own cars stand idle you will send them off to earn mileage, and your friend's cars can stand on your sidings until it is convenient to send them back empty.

In whatever way it is viewed, the most economical plan is to have very few of your own cars, and to use as many of other people's as possible, because when hard pressed you can always use your neighbor's cars in your local business for a few days without his knowing it or being able to prevent it, which facts are becoming so well recognized that some new roads do not own any cars. At this time, and possibly for some time to come, managements will have to economize, and not improbably the supply of rolling stock will fail to keep up with the increase of traffic; if so, unless the present basis of interchange is abandoned and a proper one adopted, the old established roads will be at the mercy of the needy ones.

The third principle of those stated above as the ones that should govern the interchange of cars is: "The owner should receive remuneration in proportion to the time he is deprived of the use of his car." In the early days of interchange this principle was not of much consequence; the roads kept a pretty equal supply of rolling stock, and payments were made in kind; but a change has taken place, and mutual accommodation is no longer the main object. Many roads do not pretend to pay in kind, or at any rate only to a limited extent; they prefer to pay for the use of other people's cars rather than supply any themselves. The "through freight lines" are organized on the basis of each component road's supplying cars in proportion to the business done by it; but through freight is not carried exclusively in "line cars;" in times of pressure every car available is used, and so it is that the cars put into the through business are not supplied in equal proportions by the roads using them. When the owner of a car lends it to a connecting road for the purpose of transporting the freight it contains, the implied contract is that the car shall be used for no other purpose, and shall not be kept away from its owner any longer than is necessary for the accomplishment of that purpose. One and a half cents per mile has been generally adopted as a fair remuneration to the owner, and as a method of computing which makes the rental of the car bear a proportion to the amount received by the company for transporting the freight; but, as stated above, it is implied that this rate shall cover rental only for the time necessarily consumed in hauling the car to its destination and back by direct route; if the car be delayed on the journey or at destination, or if it be used for any other purpose, the owner is entitled to extra remuneration at such rate as he may demand, or as may have been agreed on, and such rate need not necessarily have any relation to the cost of the car or interest on the cost—it should rather bear a punitive character; for if it be no more than ordinary rental of a car, then in time of pressure any road might forcibly detain cars in its local business and pay demurrage to the owner, who might perhaps be also in urgent need of his stock and value its use at that time at four or five times the amount received as demurrage. The demurrage rate should, therefore, be accumulative—say 50 cents the first day, 75 the second, \$1 the third, \$1.50 the fourth, and so on.

It appears to me very strange that the managers of well-equipped roads have allowed the miserable system of interchange now in vogue to exist so long; I cannot find that there have been many attempts to improve it, certainly no general movement. Five or six years ago there was a heavy interchange between the Memphis & Charleston and the Mississippi Central railroads, the latter being very poorly stocked, while the former was well equipped. The Memphis & Charleston insisted on the adoption of a *per diem* rate, which did not prove satisfactory and was shortly after abandoned on account of the "complication of accounts" that ensued. Previous to 1871, the Maine Central exchanged with its connections at a rate of four mills per ton per mile; its managers found that their cars were subjected to extraordinary detention on foreign roads, taking an average of seven days to perform 220 miles. A *per diem* rate of \$1.50 was then insisted on, which has produced such good results that the managers estimate the gain as equal to a 50 per cent. additional supply of rolling stock. In November, 1871, the "Blue," "White," and "Red" lines adopted a demurrage rate of \$2.00 a day for cars not unloaded within 24 hours after arrival at destination, and five dollars fine for mis-sending or mis-using; but the rules have not been very strictly enforced.

Report of the Baltimore & Ohio Railroad.

This company owns or leases the following lines:

	Miles.
Main line, Baltimore to Wheeling.....	379 1/2
Washington Branch, Relay House to Washington.....	81
Strasburg Branch, Harper's Ferry to Strasburg.....	51
Washington County Branch, Hagerstown Junction to Hagerstown.....	24
Metropolitan Branch, Point of Rocks to Washington.....	42
Parkersburg Branch, Grafton to Parkersburg.....	103 1/2
Wheeling, Pittsburg & Baltimore Railroad, Wheeling to Washington, Pa.....	32
Central Ohio Division, Bellaire to Columbus.....	137
Lake Erie Division, Newark, O., to Sandusky.....	116
Newark, Somerset & Straitsville Railroad, Newark to Shawnee, O.....	43
Total.....	969

The Metropolitan Branch was opened for traffic May 25, 1873. Since the close of the fiscal year the section of the Washington City, Virginia Midland & Great Southern Company's Manassas Division from Strasburg to Harrisonburg, Va.,

49 miles, has been leased and added to the Strasburg Branch. The report of the President for the year ending September 30, 1873, gives the earnings and expenses of the various lines as follows:

	Earnings.	Expenses.	Per cent.	Net earnings.
Main Stem, including Metropolitan, Wash'g't'n County and Strasburg Branches.....	\$12,252,843 78	\$7,313,881 15	59.69	\$4,938,961 63
Washington Branch.....	439,141 66	156,761 62	35.69	282,380 04
Parkersburg.....	948,411 27	831,257 64	87.65	117,153 63
Central Ohio Div.....	1,045,447 62	975,447 13	93.30	70,000 49
Lake Erie Division.....	777,006 12	680,555 46	88.56	96,450 66
Wheeling, Pittsburg & Balt. Railroad.....	47,364 70	46,654 61	98.50	710 18
Newark, Somerset & Straitsville R.R.....	185,326 30	126,404 03	68.25	58,922 27
Total.....	\$15,695,541 54	\$10,137,052 64	64.68	\$5,558,488 90
Total for previous year.....	13,626,677 31	8,367,474 90	61.40	5,259,202 32
Increase.....	\$2,068,864 23	\$1,769,577 65	\$299,286 58

"The earnings of the Main Stem and branches show an increase over the previous year of \$1,598,372.16, and the working expenses an increase of \$1,191,482.22, leaving an increase of \$406,889.94 in net receipts. The gross earnings of the whole system were at the rate of \$16.84 per mile, and the net earnings \$5.94, while the gross earnings of the Main Stem and branches were at the rate of \$26.09 per mile.

"The earnings of the Washington Branch were \$439,141.66, showing a decrease of \$41,505.38 compared with the previous year, and an increase of \$1,562.24 compared with 1871. The expenditures charged amount to \$156,761.62, being for improvements and for repairs of railway, depots, water stations and bridges, and for pumping water. During the year 878 tons of steel were substituted for iron rails, and 27,508 cross ties were also used. The partial expenditures charged, deducted from the revenue stated, made the sum of \$282,380.04, showing an increase compared with the preceding year of \$53,354.97. A dividend of 5 per cent. was paid on the 16th of October, 1872, for the half year terminated September 30, 1872, and on the 17th of April, 1873, a similar dividend for the term ended March 31, 1873.

"In connection with changes in the grades of the streets in the vicinity of the present station of the Washington Branch of the Baltimore & Ohio Company in Washington, a purchase has recently been made of the square of ground No. 681, on North Capitol street, at a cost of \$102,028.00. It is designed to construct upon this land a commodious station with every facility for the comfort and convenience of passengers.

"The earnings of the Parkersburg Branch were \$948,411.27, and the working expenses \$831,257.64. The earnings were \$121,608.33 more than in the previous year, whilst the expenses increased \$118,995.90, showing an improved result compared with 1872 of \$2,612.43.

"It is shown by the report of the Transportation Department that there has been a continuous large expansion of tonnage of through merchandise East and West, viz: From 557,609 tons in the preceding year to 640,265 tons. For 1871 this traffic was 435,207 tons. 940,627 barrels of flour were brought to Baltimore during the fiscal year, showing an increase of 182,785 barrels. The present increased facilities for the transportation and transfer of grain, and those which will be afforded by the additional elevator now being erected at Locust Point wharf, it is expected, lead to a great enlargement of this important and valuable trade. The traffic in live stock exhibits an increase of 15,029 tons. The coal trade shows an aggregate of 2,505,629 tons, which includes 485,911 tons for the company's supply. During the year 985 iron hopper and gondola cars, of eleven tons capacity each, have been added to the equipment. Facilities have thus been promptly furnished to supply the largely increased demand for coal. The policy of the Baltimore & Ohio Company in maintaining low and uniform rates for its transportation continues to attract a steadily enlarging traffic. The charge for the transportation of coal has continued summer and winter without change for nearly six years. The reliance which can be placed by consumers upon obtaining their supplies throughout the year without alterations of the tariff causes this route to be preferred, and the city of Baltimore to be adopted as the port for supplies for the leading ocean steamship companies, and the manufacturers and railway companies of the States of New York and New England."

"During the year 396,192 new cross ties, 8,510 tons of iron and 11,012 tons of steel rails were used for repairs and the construction of additional tracks on the main stem. In all 351 miles are now laid with steel. The work on the second, third and fourth tracks has been vigorously prosecuted and 42 miles have been laid during the year, besides seven miles of new siding in the different yards. During the year 90 first-class locomotives, 46 palace and passenger cars and 2,256 tonnage cars have been purchased or built at the company's works. The equipment upon the Main Stem and branches now comprises 513 locomotives, 307 passenger and baggage cars and 10,841 house, stock and other tonnage cars.

"The Metropolitan Branch was finally completed and opened for business May 25. The cost of this line, 42 miles long, was \$3,583,497.63, but it is thought that the line will be of constantly increasing value. On its opening the company reduced freight rates from Cincinnati and other western points to Washington about 18 per cent. The through express trains from Baltimore are now all run over this branch.

"The work on the Baltimore, Pittsburgh & Chicago road has been vigorously prosecuted, and it is expected that the road will be all graded from the junction with the Lake Erie Division at Centerton, O., to within 30 miles of Chicago. The rails will probably be laid to Deshler, on the Dayton & Michigan road, by the end of November. In order to be prepared for the increase of traffic from this new line, large improvements have been made on the Lake Erie and Central Ohio divisions."

Reference is made to the European steamship lines running to Baltimore, the capacity of which has been increased during the year by two new vessels of 3,000 tons each. Reference is also made to the improvements now being made in the harbor of Baltimore and its approaches.

The report speaks of the combination made last March by some of the leading railroad lines, which entered into an agreement to discontinue the running of postal cars except upon terms which could not be legally paid by the Post-office Department. The Baltimore & Ohio company refused to enter into this combination, and tendered to the Postmaster General the use of its lines and, with their consent, of its principal connections, with the proposition that the remuneration should be equitably adjusted at the convenience of the Government. This proposition was promptly accepted.

"The Marietta & Cincinnati, the Washington City, Virginia Midland & Great Southern and the Pittsburgh, Washington & Baltimore companies have continuously made important improvements and extensions. In view of the great importance of these lines to interests with which the Baltimore & Ohio is identified, it has been deemed judicious to continue to extend to them material financial aid which their necessities demanded. It is hoped that the ultimate benefits to be derived

from these valuable auxiliaries to the trade of Baltimore will vindicate the liberal action of the company."

The report says:

"During the fiscal year the sinking fund for the redemption of the city loan increased to \$1,538,553.20, showing a gain of \$89,300. Under the action of the sinking fund for the redemption of the sterling loan of 1895, £52,000 of bonds have been purchased in London and cancelled, thus, at \$4.84 per pound sterling, reducing the debt \$251,680 and showing a gain during the fiscal year of £18,000, equivalent, at \$4.84 per pound sterling, to \$87,120. In accordance with the principles on which the sinking fund for the redemption of the sterling loan, which matures in 1902, is established, £37,600 of those bonds have been retired and cancelled, thus, at \$4.84 per pound sterling, reducing that debt \$181,984; £24,000 per annum are appropriated for this sinking fund, which, with the interest accruing from its accumulations, will, it is expected, redeem and cancel these bonds prior to their maturity. Semi-annual dividends of 5 per cent. upon the capital stock were paid on the 1st of November, 1872, and on the 1st of May, 1873, respectively.

"The liabilities of the company, compared with the statement of September 30, 1872, show the following reduction, viz: By the payment of the remainder of the second mortgage bonds of the Northwestern Virginia Railroad Company (now the Parkersburg Branch Railroad Company), which were guaranteed by the Baltimore & Ohio Railroad Company, and which matured January 1, 1873, the original sum having been \$1,000,000—\$453,500.00.

"The liabilities also show the following increase, viz:

Preferred stock, second series, 6 per cent. currency....	\$15,100 00
Sterling Loan, redeemable in 1902, £1,700,000—\$4.84 gold	8,228,000
	\$8,243,100 00

"The profit and loss account shows an increase for past year of \$2,382,134.35. It will be seen by this account that the surplus fund, which represents capital derived from earnings invested in the various branch and connecting roads, and the great improvements that have been continuously constructed on the main line, and which is not represented by stock or bonds, now amounts to \$29,094,493.71."

During the four years ending with September, 1872, the expenditures of the company for new construction amounted to \$4,718,300.78, and covered 68 locomotives, 2,913 freight and passenger cars, 22 miles of second track, various structures and machinery and real estate. For the following year these expenditures amounted to \$4,749,935.95 for 90 locomotives, 2,302 cars, 42 miles of new tracks (2d, 3d and 4th), new hotels, mills, etc. Other expenditures have been: \$3,583,497.63 for the construction of the Metropolitan Branch; \$2,382,480.04 for the Ohio River bridges; for retiring mortgages on the Parkersburg Branch, \$2,860,000 (leaving due but \$140,000 of the original mortgage for the construction of that line); \$5,280,769.87 in retiring other bonds through sinking funds. The total of these expenditures is \$23,574,984.22.

"In the autumn of 1872 \$700,000, and in August last \$1,000,000, being the remainder of the mortgage loan of 1902 for \$2,000,000, were negotiated in London on satisfactory terms and at periods when the railway companies of America generally found it impracticable to effect loans in Europe. The uniformly conservative and prudent course of the Baltimore & Ohio Company in making moderate dividends, and in applying its large additional earnings and resources to the construction of needed and important permanent works, and in securing valuable connections, thus investing its undivided net earnings judiciously and steadily until its surplus fund amounts to \$29,094,493.71, a sum unprecedented in the history of railway companies in Europe or America, has attracted and commanded the confidence its system and policy merit. At a period when the undertakings of other companies are suspended from their inability to obtain the capital required, it has been shown by their recent action that there is every reason to believe that European capitalists will continue to invest in securities of the Baltimore & Ohio Company to the extent that may be desired to enable it to prosecute with vigor to completion the great works in which it is engaged, and which will prove of the highest value to the cities of Baltimore and Washington and to the States of Maryland, Virginia, West Virginia, Ohio, Indiana and Illinois, and practically, in view of the advantages of such powerful competing routes, to the Southern, Southwestern, Western and Northwestern States generally."

ELECTIONS AND APPOINTMENTS.

—Col. John C. Holland has been re-elected President; Henry Grane, Treasurer; and W. W. Orndorff, Secretary of the Baltimore & Catonsville Railroad Company for the ensuing year.

—At a meeting of the board of directors of the Pacific Mail Steamship Company in New York, November 18, Mr. Rufus Hatch was chosen Vice-President, in place of S. H. Holman, removed. Mr. Russell Sage was appointed President *pro tem.* during the absence of Captain Bradbury in California.

—The new board of directors of the New Haven, Middletown & Willimantic Railroad Company has elected the following officers: President, Julius Hotchkiss; Secretary, Albert G. Pike; Treasurer, A. M. Colegrove.

—At the annual meeting of the Monadnock Railroad Company in Peterborough, N. H., November 17, the old board of directors was re-elected, as follows: J. H. Bradley, Peter Upton, East Jaffrey, N. H.; H. K. French, Jonas Livingston, Peterborough, N. H.; J. H. Fairbanks, Winchendon, Mass.; H. A. Blood, Fitchburg, Mass.; Willis Phelps, Springfield, Mass.

—At the annual meeting of the Washington County Railroad Company in Hagerstown, Md., November 18, the old board of directors was re-elected, as follows: Johns Hopkins, Galloway Cheston, Robert Fowler, Baltimore, Md.; Peter B. Small, G. S. Kennedy, E. W. Mealey, Jacob A. Miller, Hagerstown, Md. Robert Fowler was re-elected President and Peter B. Small, Secretary and Treasurer.

—At the annual meeting of the Montpelier & White River Railroad Company in Barre, Vt., November 13, the following directors were chosen: Josiah Wood, E. E. French, N. W. Bralley, Barre, Vt.; John Lynde, Milton Martin, Williamstown, Vt.; Marcus Peck, Brookfield, Vt.; George O. Davenport, Randolph, Vt. The board subsequently elected Josiah Wood, President, and L. F. Aldrich of Barre, Clerk and Treasurer.

—Mr. Edward White, formerly, for 17 years, in charge of the locomotive pattern shop of the Chicago, Burlington & Quincy Railroad at Aurora, is now Superintendent of Cars of the United States Rolling Stock Company.

—At the annual meeting of the Richmond, Fredericksburg & Potomac Railroad Company in Richmond, Va., November 19, the following directors were elected: H. A. Claiborne, C. S. Mills, Philip Haxall, Richmond, Va.; Elihu Chauncey, Philadelphia, Pa. Andrew Johnston, of Richmond, is director on behalf of the State of Virginia. Mr. Haxall takes the place of W. B. Myers. John M. Robinson, of Richmond, Va., was re-elected President.

—Col. Robert Andrews, formerly Superintendent of the Illinois Division and later Chief Engineer, has been appointed General Superintendent of the Toledo, Wabash & Western Railway, to succeed Mr. George H. Burrows.

—Mr. J. S. Oliver, heretofore Assistant Superintendent, has been appointed Superintendent of the Iowa Division of the

Chicago & Northwestern Railway, in place of Mr. John B. Watkins, who was killed a short time since. Mr. S. J. Mills, heretofore Train Dispatcher, is appointed Assistant Superintendent of the Division, to succeed Mr. Oliver.

—At a meeting of the directors of the Poughkeepsie Bridge Company in New York, November 25, Mr. J. H. Linville was appointed Chief Engineer and Mr. J. Edgar Thomson Consulting Engineer.

—At the annual meeting of the Old Colony Railroad Company in Boston, November 25, the old board of directors was re-elected, as follows: Onslow Stearns, Uriel Crocker, Francis B. Hayes, Boston; Richard Borden, John S. Brayton, Fall River, Mass.; Oliver Ames, North Easton, Mass.; Charles F. Choate, Cambridge, Mass.; Samuel L. Crocker, Taunton, Mass.; Jacob H. Loud, Plymouth, Mass.; Royal W. Turner, Randolph, Mass.; Ephraim N. Winslow, Hyannis, Mass.; Prince S. Crowell, Dennis, Mass.; Benjamin Finch, Newport, R. I.

—Mr. Edward T. Prindle, for twenty years in the service of the Chicago, Burlington & Quincy Railroad Company, for a year or two past being Master Mechanic of the Aurora shops, and before that Foreman of the Locomotive Shops, has resigned to accept a position in the great machine shops of the Crane Brothers' Manufacturing Company, Chicago (formerly Northwestern Manufacturing Company).

—It is reported that Mr. H. H. Porter will succeed Col. James H. Home as General Manager of the Chicago & Northwestern Railway. Mr. Porter came into the Northwestern board with Mr. John F. Tracy, and has been a member of the Executive Committee since and one of the most active of the board in the management of the road. Mr. Porter was in the service of the old Galena & Chicago Union Railroad, the parent of the Northwestern, and was General Superintendent of the Michigan Southern at the time when Mr. M. L. Sykes, Jr., now Vice-President of the Northwestern, was President of the former company.

—The Governor of North Carolina has appointed C. C. Pool, of Pasquotank County; A. M. Moore, of Chowan County, and E. F. Baxter, of Currituck County, State directors of the Albemarle & Chesapeake Canal Company.

TRAFFIC AND EARNINGS.

—The earnings of the Richmond, Fredericksburg & Potomac Railroad for the year ending September 30, 1873, were:

Gross earnings (\$5.776 per mile).....	\$496,744 25
Expenses (59 1/2 per cent.).....	261,608 54
Net earnings (\$2.688 per mile).....	\$231,135 71

—The earnings of the Erie Railway for the second week in November were: 1873, \$424,309; 1872, \$488,804; decrease, \$64,495, or 13 1/2 per cent.

—The earnings of the Denver & Rio Grande Railway for the second week in November were: 1873, passengers, \$3,733.02; freight, \$2,847.17; total, \$6,580.19; 1872, total, \$8,163.95; decrease, \$1,583.76, or 19 1/2 per cent.

—The receipts of the Pacific Mail Steamship Company for the five months ending September 30, 1873, were \$3,012,299.72; expenses, including taxes for 1872 and 1873, \$2,950,555.79; leaving the net earnings, \$61,743.93.

—The earnings of the Ohio & Mississippi Railway for the month of October were: 1873, \$325,841; 1872, \$407,261; decrease, \$81,420, or 20 per cent. For the ten months ending October 31, the earnings were: 1873, \$3,078,360; 1872, \$2,898,686; increase, \$179,675, or 6 1/2 per cent. Earnings per mile, 1873, \$7,833; 1872, \$7,376; increase, \$457, or 6 1/2 per cent.

—The earnings of the Great Western Railway of Canada for the week ending October 31 were: 1873, \$25,107; 1872, \$24,897; increase, \$210, or 0 1/2 per cent.

—The earnings of the Grand Trunk Railway of Canada for the week ending November 1 were: 1873, \$47,300; 1872, \$40,500; increase, \$6,800, or 16 1/2 per cent.

—The earnings and expenses of the Monadnock Railroad for the year ending September 30, 1873, were:

Earnings (\$1.932 per mile).....	\$32,843 90
Expenses (64 1/2 per cent.).....	21,117 36
Net earnings (\$600 per mile).....	\$11,726 54
Interest.....	8,689 66
Surplus.....	\$3,036 88

—The earnings of the Cheeshire Railroad for the year ending September 30, 1873, were as follows:

Gross earnings (\$9.503 per mile).....	\$845,807 43
Expenses (78 1/2 per cent.).....	661,511 63
Net earnings (\$2.071 per mile).....	\$184,295 80

—The earnings of the St. Louis & Southeastern Railway for the first week in November were: 1873, \$36,444.38; 1872, \$23,979.86; increase, \$2,464.52, or 10 1/2 per cent.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the second week in November were: 1873, \$24,788.2; 1872, \$22,971.02; increase, \$1,817.22, or 7 1/2 per cent.

CHICAGO RAILROAD NEWS.

Chicago & Northwestern.

This company has removed its general offices to the new building just completed at the corner of Kinzie and North Market streets. The building is constructed of brick on a stone foundation, three stories in height above the basement. It has a frontage of 186 feet on Kinzie by 60 feet on Market street. The structure is a substantial and a most commodiously appointed building. The basement contains the boilers, furnaces and fuel rooms, a lunch room 23x60 feet in size, a kitchen furnished with cooking range and all the stores and utensils for the preparation of lunches. The Purchasing Agent has a room also in the basement for storage purposes; and there are besides the above named rooms, a mailing room and apartments to be devoted to the company's surgical staff. The first floor contains rooms for the use of the General Freight Agent, the Division Superintendents, the Purchasing Agent, Ticket Agent and the conductors. The General Freight Agent's room is 23x97 feet in size, conductors' room 23x50 feet, and the General Ticket Agent's room 70x23 feet. The second floor contains the Treasurer's office, a room 100x23 feet in size; the offices of the Auditor, Solicitor, General Superintendent and General Manager and President. The third floor contains the rooms of the telegraph operators, the Chief Engineer, the Land Department, and of the draughting department of the Engineer.

The rooms are all large and very commodious, and fitted with the most approved equipment for comfort and the dispatch of work. The building is amply protected against danger from fire, iron pipes connected with the street mains being distributed in all parts, and in addition a tank is constructed just below the roof which will always contain some 3,000 gallons of water. All the floors and all the rooms are provided with strong, fire-proof vaults. An elevator for the transportation of fuel from the basement to any room in the building has been provided. The entire cost of the building is \$120,000.

Col. James H. Howe, General Manager of the Chicago & Northwestern Railroad, has resigned his position, the resignation to take effect as soon as his successor can be appointed.

Colonel Howe, it is reported, will be appointed by President Grant to the vacancy in the United States District Court, for the Eastern District of Wisconsin, made by the resignation of Judge Miller, of Milwaukee.

Milwaukee & St. Paul.

Arrangements have been perfected between this company, the Wisconsin Central, and the Milwaukee & Northern, whereby these three companies will exchange business and work together. The Milwaukee & St. Paul Company will run through passenger trains from Chicago to Green Bay on the first of December, and after a time to Menasha and Stevens Point.

Chicago & Alton.

The bridge at Louisiana requires about two weeks of time to complete it; but as the weather is not likely to be very propitious, it will probably take until about Christmas before it will be passable. The material is all on the ground, so that the work cannot be interfered with by running ice.

Chicago, Rock Island & Pacific.

A slight change of time has been made in the arriving time of two trains, so that the train which has heretofore arrived at 3:45 p. m. arrives at 4, and the train which arrived at 7 arrives at 8:30 p. m.

Chicago, Pekin & Southwestern.

The through trains from Chicago to Peoria over this road have been taken off for the winter and will not be run again until next spring.

Chicago & Paducah.

Tracklaying has been commenced on the extension of this road from Windsor, Ill., southward. It is expected that 15 miles of track will be laid this fall, which will bring the road to the north line of Edgingham County.

Michigan Central.

Wells, French & Co., the contractors, have very nearly completed a new bridge for this company over the St. Joseph River at Niles, Mich.

Chicago, Burlington & Quincy.

The new shops at Aurora are well ahead. The tools and machinery are going into the blacksmith shop; the chimney (which will be 124 feet high above the water table) begins to overtop the buildings around; the slating of the car-shops is completed; and the old Corliss engine house has been converted into a pattern shop for the locomotive department. Men now work on eight hours time, beginning at 7 1/2 in the morning and stopping at 4 1/2 in the afternoon.

On the 18th, six extra and five regular stock trains passed through Aurora over this road, having in all 238 car-loads of stock.

PERSONAL.

—Mr. C. W. Smith, General Manager of the Indianapolis, Bloomington & Western, and Peoria & Rock Island railroads, has resigned that position on the Peoria & Rock Island. His resignation took effect November 17.

—Col. John G. Stevens, now associated with Mr. Abram S. Hewitt as Receiver of the New York & Oswego Midland Railroad, was long connected with the Camden & Amboy Company. He was Superintendent of the Delaware & Raritan Canal until early in 1872, when he was chosen President of the United New Jersey Railroad & Canal Company.

—Concerning the financial position of the two great chiefs of the Pennsylvania Railroad Company the Philadelphia *Public Ledger* says: "Col. T. A. Scott, one of the indorsers of the paper of the construction company of the Texas & California [meaning Texas & Pacific] Railroad Company, proposes to settle with holders in payments extending from two to twenty-four months. He probably speaks for his co-indorsers, except, perhaps, Mr. Thomson and Mr. Houston, who owe with the other three on only about \$1,700,000, all which amount of paper, it is said, will be protected by payment as it matures. It is understood that Mr. Thomson's liabilities, in connection with these indorsements, have been narrowed to about \$500,000, a sum quite within the means of his private fortune. So that while the Pennsylvania Railroad Company is in no way connected with the losses of the Texas & California Company, the President of the Pennsylvania Railroad even is likely to maintain his personal credit unimpaired. Colonel Scott is quite sanguine, if his creditors will extend to him the credit he asks, all will get their money; if they should decline this, and press for immediate payment, they must be satisfied with what they can get."

THE SCRAP HEAP.

Train Wreckers.

On the Quincy, Alton & St. Louis Railroad, several attempts have been made to wreck trains between Quincy and Hull's, and last September, near Rockport, a hand-car was thrown off by an iron wedge which had been driven in at the side of a rail, seriously injuring one man. The wedge was discovered and removed, watch kept, and in a few weeks a youth was caught who confessed to have committed the deed. He was bound over for trial.

On the 1st of October obstructions were discovered on the track of the Chicago & Northwestern Railway, about two miles west of Boone, Iowa, by an extra freight, which was running ahead of an express said to have had half a million of money in the express car. On the 4th a similar attempt to wreck a train was made a mile and a half west of Grand Junction, when a mail train actually ran over a tie and a stone.

On the night of the 18th of October, an express train with nine coaches was thrown from the track by three ties which had been placed across the track near Verona, N. Y., on the New York Central & Hudson River Railroad, and the fireman had his leg broken, and about the same time a train met a similar obstruction which it brushed aside without damage.

The *Nashua* (N. H.) *Telegraph* of November 10 says: "Last night, when the Sunday passenger train was nearing the city at a speed of forty miles an hour, the locomotives struck a 'gigger,' in other words, strips that are framed together for the purpose of turning a hand car, that some miserable scoundrel had placed upon the track evidently for the purpose of wrecking the train. The engineer, Mr. Oliver Clark, says that when the locomotives struck it seem as though its forward end was thrown a foot or more into the air. It fortunately came back upon the track all right, and the train crushed it and passed in safety. The engineer is not a timid man, and yet he expresses himself as not desirous of taking such fearful chances again. This is the second attempt to wreck a train coming into this city within a few weeks, the first being on the flying switch at the Concord depot, some one opening a switch which the brakeman discovered in season to save his train. No punishment can be too severe for such fiends should they be caught."

Old Conductors.

Mr. Charles Moore, a conductor on the Morris & Essex Division of the Delaware, Lackawanna & Western Railroad, has been on the Morris & Essex road for 28 years. Three other conductors, Messrs. Hulmes, Johnson and Corby, have been on the road for terms varying from 15 to 20 years, while Messrs. Hubbard, Allen and Sayres have run nearly 15 years. Mr. Moore has served under 11 different superintendents, and is, we believe, the oldest officer on the road.



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CONTENTS.

ILLUSTRATIONS:	Page	GENERAL RAILROAD NEWS: Page		
Winslow's Nut Lock.....	477	The Scrap Heap.....	479	
Piret's Axle Box, facing.....	480	Old and New Roads.....	483	
CONTRIBUTIONS:		EDITORIALS:		
Accidents Prevented by Safety Chains.....	477	Testing Locomotives.....	480	
Can our Railroads afford to Kill 328 Persons, etc.....	477	Railroad Question in Mexico.....	480	
Long Runs.....	477	Costliness of Accidents.....	481	
Rail Joints.....	477	The Abolition of Commissions.....	482	
Mr. Kingsbury's "New Style of Coupon Tickets".....	477	The Piret Axle Box.....	482	
Interchange of Freight Cars.....	477	Chicago & Lake Huron Railroad.....	482	
GENERAL RAILROAD NEWS:		Record of New Railroad Construction.....	482	
Report of Baltimore & Ohio.....	478	EDITORIAL NOTES.....	482	
Elections and Appointments.....	479	NEW PUBLICATIONS:		
Personal.....	479	Elements of Physical Manipulation.....		483
Traffic and Earnings.....	479			
Chicago Railroad News.....	479			

Editorial Announcements.

Removals.—The Chicago office of the RAILROAD GAZETTE has been removed to No. 71 Jackson street, opposite Third avenue. The New York office of the RAILROAD GAZETTE is removed to Room 131, No. 73 Broadway, opposite the upper elevator landing.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

TESTING LOCOMOTIVES.

Accurate records of carefully conducted experiments made with good locomotives are always valuable and contribute much useful information, and do more to improve the economy of such engines than purely theoretical speculation will. An account of the method which was recently employed to make a series of tests of locomotives on a leading railroad may therefore be of interest, and possibly have some value to those who intend to make similar experiments.

The tests referred to were made at the request of the Superintendent of the line, and for the purpose of eliciting information for the use of the officers of the road. The kind of information sought may be inferred from the following directions given by the Superintendent to the person employed to make the experiments:

- "It is desirable to ascertain and state:
- "The dimensions of the engines compared as to diameter of cylinder, stroke, diameter of boilers, exhaust nozzles, etc., etc.
- "2. Their weight and the distribution upon driving wheels.
- "3. The weight of the train hauled.
- "4. The weight of coal consumed in hauling the same train over the same route by each engine.
- "5. The quantity of water evaporated by each engine in doing the work.
- "6. The relative amounts of smoke and cinders which escaped from the smoke stacks.
- "7. The temperature of the gases escaping.
- "8. The tractive resistance of the train at the same places as indicated by a dynamometer during the trips of each engine.
- "9. The pressure of steam in the cylinders of the several engines, as shown by indicator diagrams, the pressure indicated in the boilers being recorded at the same time.
- "10. The time occupied in making each trip and between points, which should be as nearly uniform as possible.
- "11. The temperature of the air at starting, in the middle, and at the end of each trip.
- "12. The temperature of the water in the tenders."

The object of making the experiments was to determine the relative economy of working of two different classes of engines. In order that they might do as nearly as possible the same work, a train of freight cars was loaded with sand and stone, the stone on platform cars, and the sand in box cars, so as to be protected from rain. These cars, with the same loads, were used for all the experiments. Before running the cars their journal boxes were carefully examined and put in good condition and thoroughly oiled, and each car weighed. The boxes were all oiled before each experimental trip, which consisted of a run of 72½ miles and back, making 145 miles for each engine. Two series of experiments were made with an ordinary train of 30 cars, and two more with a train of 40 cars, which latter was the maximum load the engines could pull. The object was to determine the relative economy in doing ordinary work, and then to test the engines with their maximum loads.

To determine the weight of the engines, they were

weighed with steam on, and as nearly as possible in the condition they were in while working on the road. The weight on drivers and truck was weighed at the same time. After the engines were weighed with steam on, all the water in the boilers was blown out, and the engines weighed empty, so as to determine the capacity of the boilers.

The weight of the coal consumed was ascertained by first sweeping out the tender, and then carefully weighing the supply to be used, and on returning weighing what was left. The difference of course gave the amount consumed. In order to get as nearly as possible the same quality of coal, cars just from the mines were set aside and the supply taken from them. For the first experiments the coal was taken just as it ran on the cars, but as some question arose regarding the relative amount of fine coal used by the different engines, in the subsequent experiments it was picked by hand, and only lumps were used, so as to make the fuel uniform for each engine.

The quantity of water evaporated was determined by a gauge consisting of a wooden float placed on the surface of the water through the man-hole in the tender. To this float was attached a wooden rod or stem, which was graduated in inches and moved easily through a hole in a board which rested on the coping of the man-hole. By observing with this gauge the height of water in inches as indicated by the position of the stem in relation to the board referred to, after and before the tender was filled, the difference would of course give the number of inches of water used. The quantity of water contained in each inch indicated by the gauge was ascertained by placing the tender on a track scale and then measuring the water in it and weighing the tender. The water was then allowed to run out until the gauge indicated 12 inches less than at first. The tender was then weighed again, and the difference in weight showed the weight of 12 inches of water, from which of course the weight of an inch was easily determined. In making experiments care should of course be taken to stop all leaks about the engine and tender, and no water should be wasted by the injector, or for wetting coal, as is usually done.

The relative amount of smoke and cinders which escape from the smoke-stack is more difficult to determine accurately than almost any other phenomenon about the working of an engine. The only method employed in the experiments we are describing was to watch the top of the chimney when fresh coal was put on the fire and see how many seconds black smoke escaped from it. This of course was not a very positive or accurate way of estimating, but it gave approximately correct results. To determine the quantity of sparks which escape we know of no better way than to watch the engines while working hard at night, when the sparks are visible.

The temperature of the gases in the smoke-box was taken by a pyrometer, the stem of which was inserted inside immediately in front of the tubes. An observation was taken from this and recorded every minute, and at the same time a boy in the cab noted the steam pressure from the gauge. Such records were taken for a distance of 30 miles, and again on the steepest grade on the road, so as to show the temperature at ordinary and again when doing the heaviest work. The instrument used was made by Tagliabue, of New York.

An effort was made to ascertain the resistance of the train from a dynamometer placed between the tender and the front car. The instrument used was composed of coiled springs, arranged with a rack and pinion so as to operate an index finger which indicated the strain on the springs. We have already (in the GAZETTE of September 6) referred to the difficulty of determining the resistance of a train from such an instrument. It will only be necessary to say here, that in order to ascertain correctly the resistance of a train, some means must be taken to determine the speed, which is a very important element in the problem.

The application of the indicator and the method of doing it we will describe more at length in a future number, as we are having some engravings prepared to illustrate it.

The running time was ascertained by noting the time of arrival and departure at each station. The road on which the experiments were made unfortunately had no mile posts, otherwise the time could have been noted with much greater accuracy by recording the time of passing each post. The running time was made as nearly uniform as possible by making up a time table of the running time on the first day, and obliging the locomotive-runner on the second engine to conform as nearly as possible to the running time of the first. One of the chief difficulties is to keep other trains out of the way, and special arrangements should be made with the train dispatcher to give the experimental train the right of way over all, excepting perhaps express passenger trains, as it makes a very material difference in the amount of fuel consumed if an engine is obliged to back into side tracks, and do similar extra work. After the experiments were completed, the running of the different trains was carefully plotted on a sheet of profile paper, so as to show clearly their running time in relation to each other. The horizontal lines on the

paper were made to represent distance and the vertical lines time. Black horizontal lines were drawn at the proper position to represent the stations. The path of the different engines was then drawn with different colored inks, as follows: engine No. 1 left station A at 8:55 a. m., and reached station B at 9:19. The line representing its path therefore begins at the intersection of the vertical line which indicates 8:55 a. m. with that representing station A, and is drawn diagonally downward to the intersection of the 9:19 a. m. line with station B. The train reached station C at 9:41. The line showing its path is therefore carried down from B station to the intersection of the 9:41 line with the line representing station C. If the train left C at say 10:15, the line representing its path would be moved along, and not start from the station until the time of leaving. In this way the length of the stops as well as the running time is clearly represented, and when the paths of two or more trains are represented side by side, their rate of inclination and position shows at a glance exactly how the trains ran and their relative running time. To represent the return trip the direction of the lines was of course reversed vertically, but not horizontally.

The temperature of the air was of course taken with an ordinary thermometer; that of the water in the tenders in the same way. The latter we do not regard as of much importance, as the temperature soon changes after running a short time in the tender.

In making such experiments it will be found that one or more assistants are necessary, besides the train and engine-men, as often one man cannot be at two places simultaneously or do two things at once, as is often necessary. This is especially desirable if there is any rivalry, as there is almost certain to be in such experiments. The men who run the engines and others will be sure to feel a pride in winning over their competitors, so it is often desirable to change the men from one engine to the other, and at the same time exercise the utmost vigilance to prevent any unfair play.

Great caution must also be taken to insure accuracy in the instruments used. Scales should be tested before weighing the coal or engines. Steam gauges will be found especially liable to inaccuracy, and should be tested daily, and the safety-valves set to blow off at the maximum pressure. The kind of pyrometer used in the experiments we are describing is tested by immersion in steam, whose temperature is ascertained by a thermometer. In this way the scale is graduated from say 50 to 450 degrees, and the higher temperatures are graduated on the same scale, on the supposition that the expansion of metals up to the melting point is proportional for all temperatures. It will however, always be a useful precaution to use two pyrometers in the smoke-box at the same time, so that the one may be a check on the other.

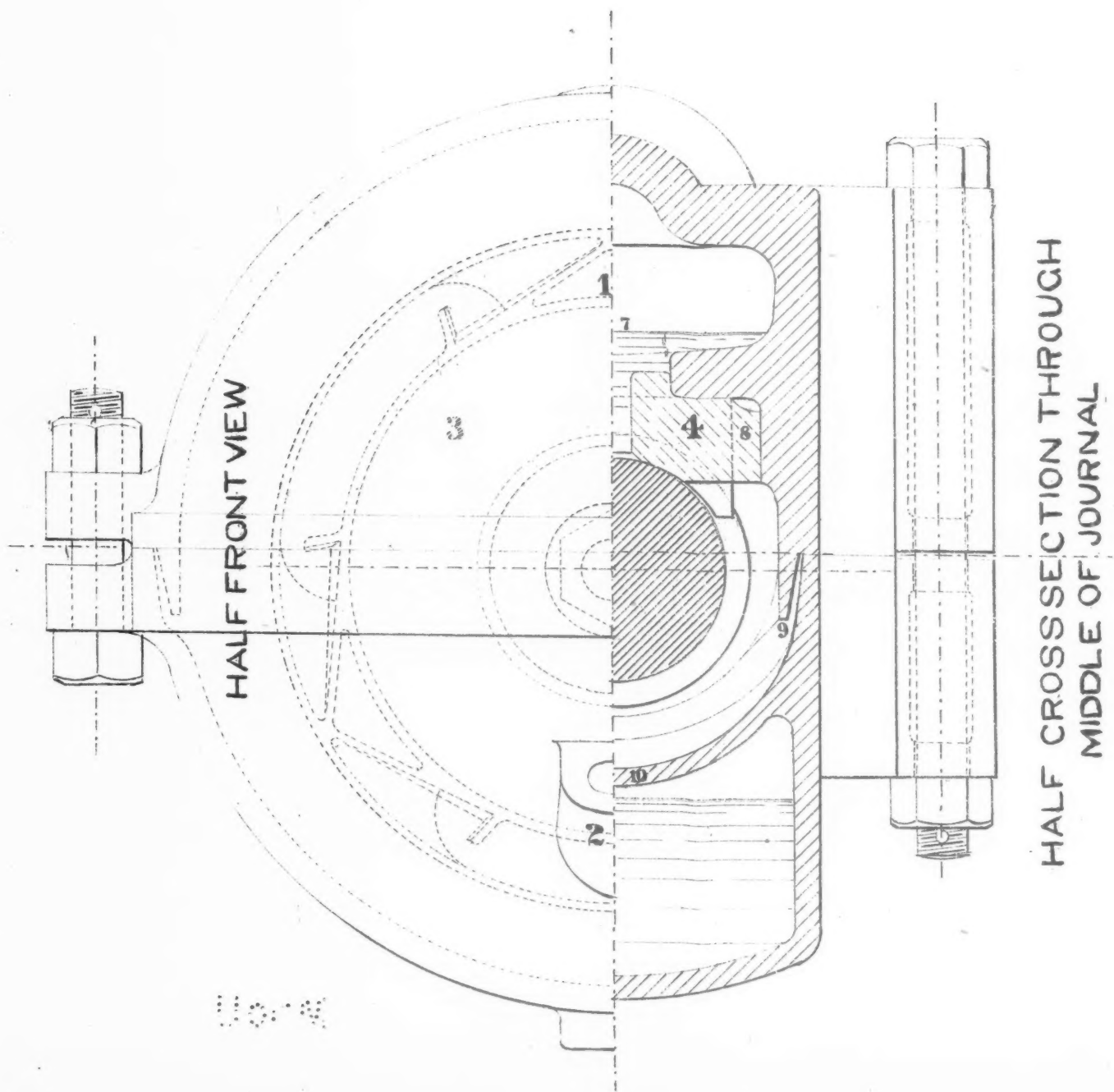
An engine after it is put in complete order for experimenting should always be run at least one trip to ascertain whether it is in good working condition, as there are so many parts which are liable to get out of order that unless the utmost caution is used some of them will fail during the trial, which is of course liable to vitiate the experiments.

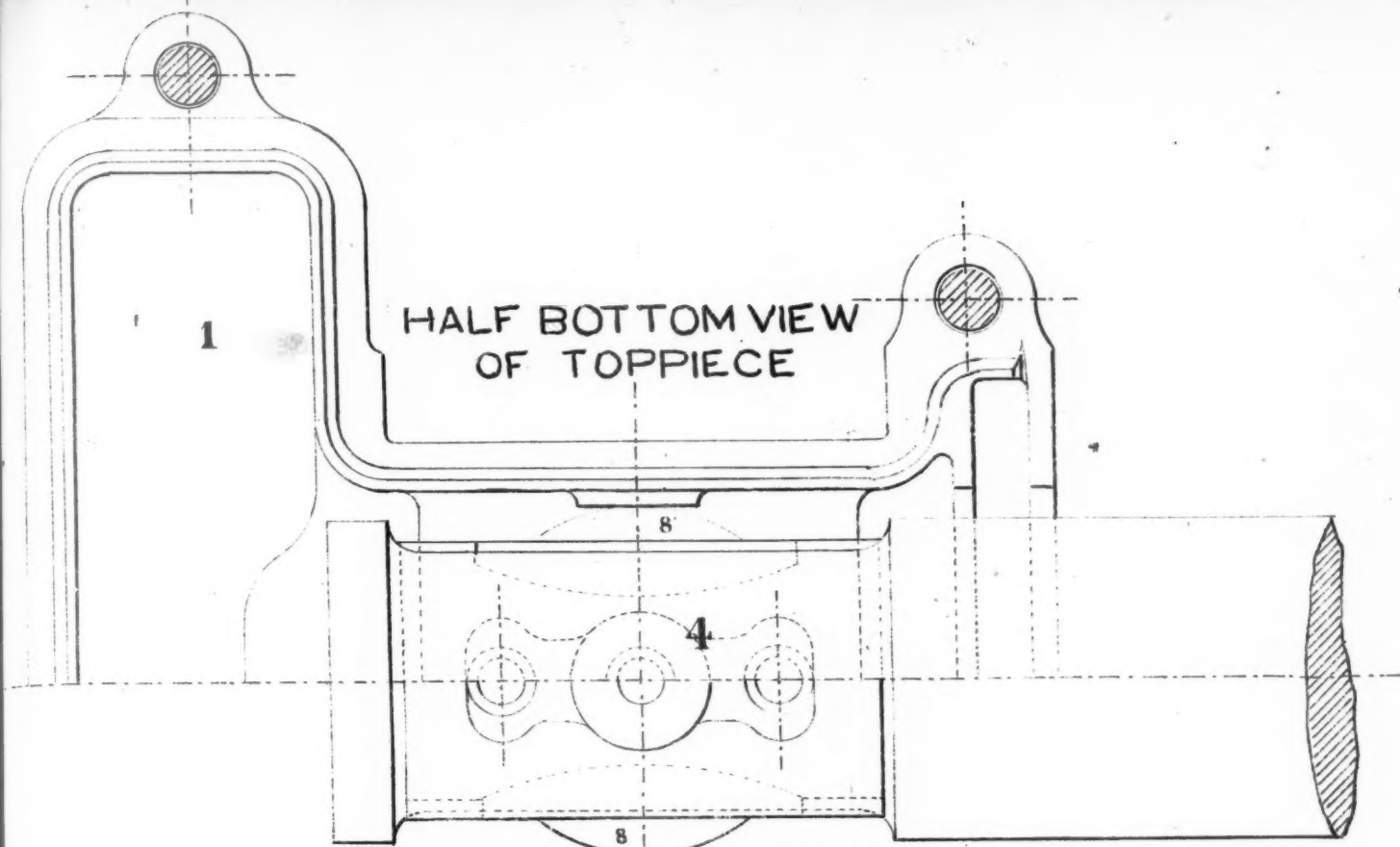
We have several times called attention to the valuable results which would be likely to follow from a series of competitive trials with locomotives built by different makers. We are all familiar with the announcements of horse races which annually attract so much attention, and absorb so much money in all parts of the country. It would certainly be a much higher and more useful form of racing if all the skill and science which can be so effectively applied to the construction and management of locomotives were enlisted in competing for success in a field where success would have so much value. The competitive trials of portable engines in England have resulted in a degree of improvement in the construction and economy of operation which probably would never, or at least not for a long time, have been reached without this stimulus. We should like to see this subject taken up by either the Master Mechanics' or the Superintendents' Association.

THE RAILROAD QUESTION IN MEXICO.

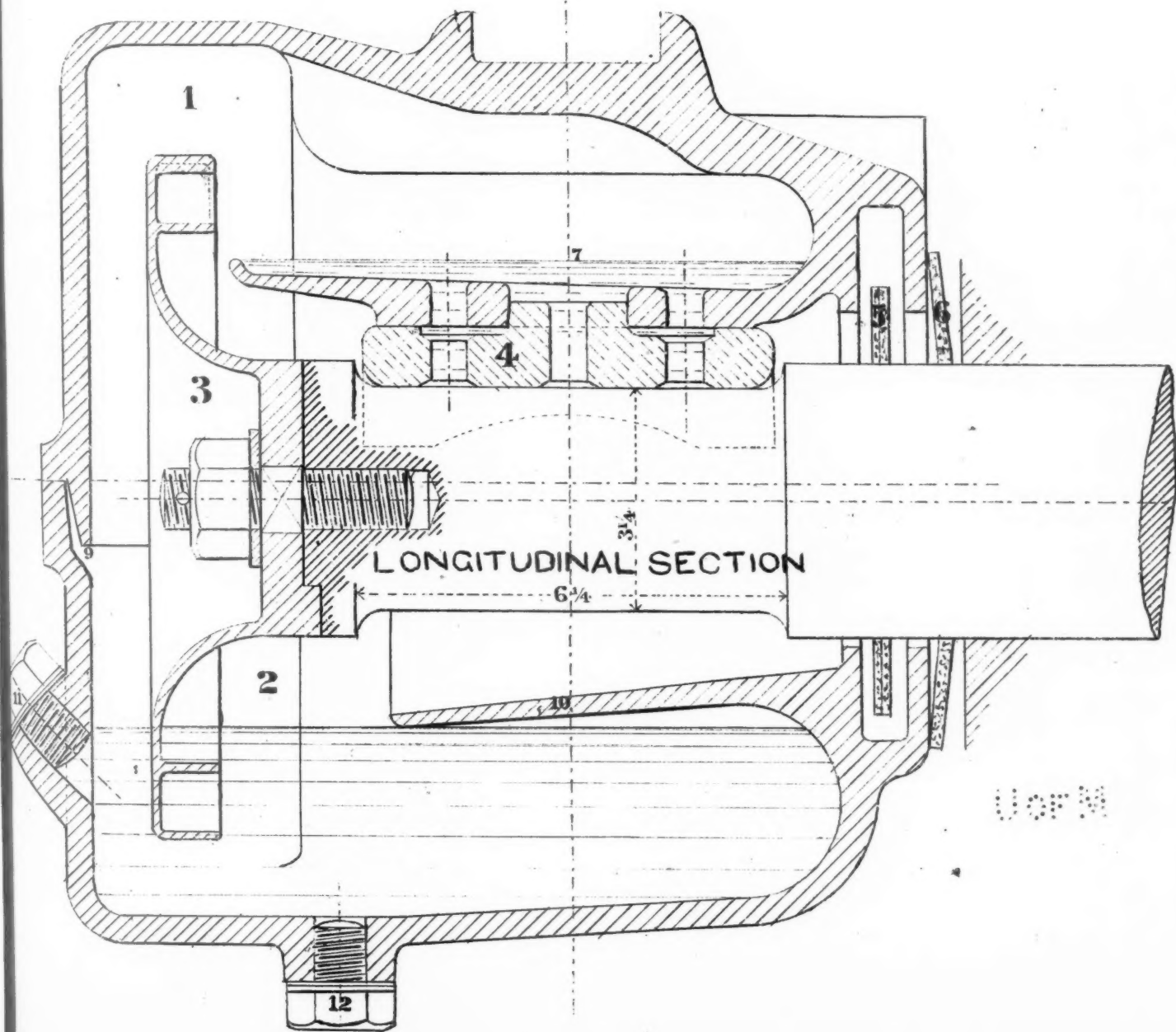
The question with Mexico is and long has been, how to get railroads at some rate or other. The interior for some distance around the city of Mexico is quite thickly peopled and has a number of large cities at no very great distance from each other, and not only has there been no railroads, but there is scarcely a civilized country on the globe so poorly provided with water communications, natural or artificial. The great table lands where the greater part of the population live have scarcely any navigable streams, and no chains of lakes which serve as an outlet to the coast or for intercommunication, and until recently all exports and imports were drawn over mountain roads to and from the sea coast. One great obstacle to the establishment of a railroad system was the extremely difficult nature of the route from the Atlantic to the interior table lands. The ascent is made almost at once, and can only be made practicable for a railroad by very costly work. This first connection of the interior with the sea was completed nearly a

THE 'PIRET' AXLE-BOX.

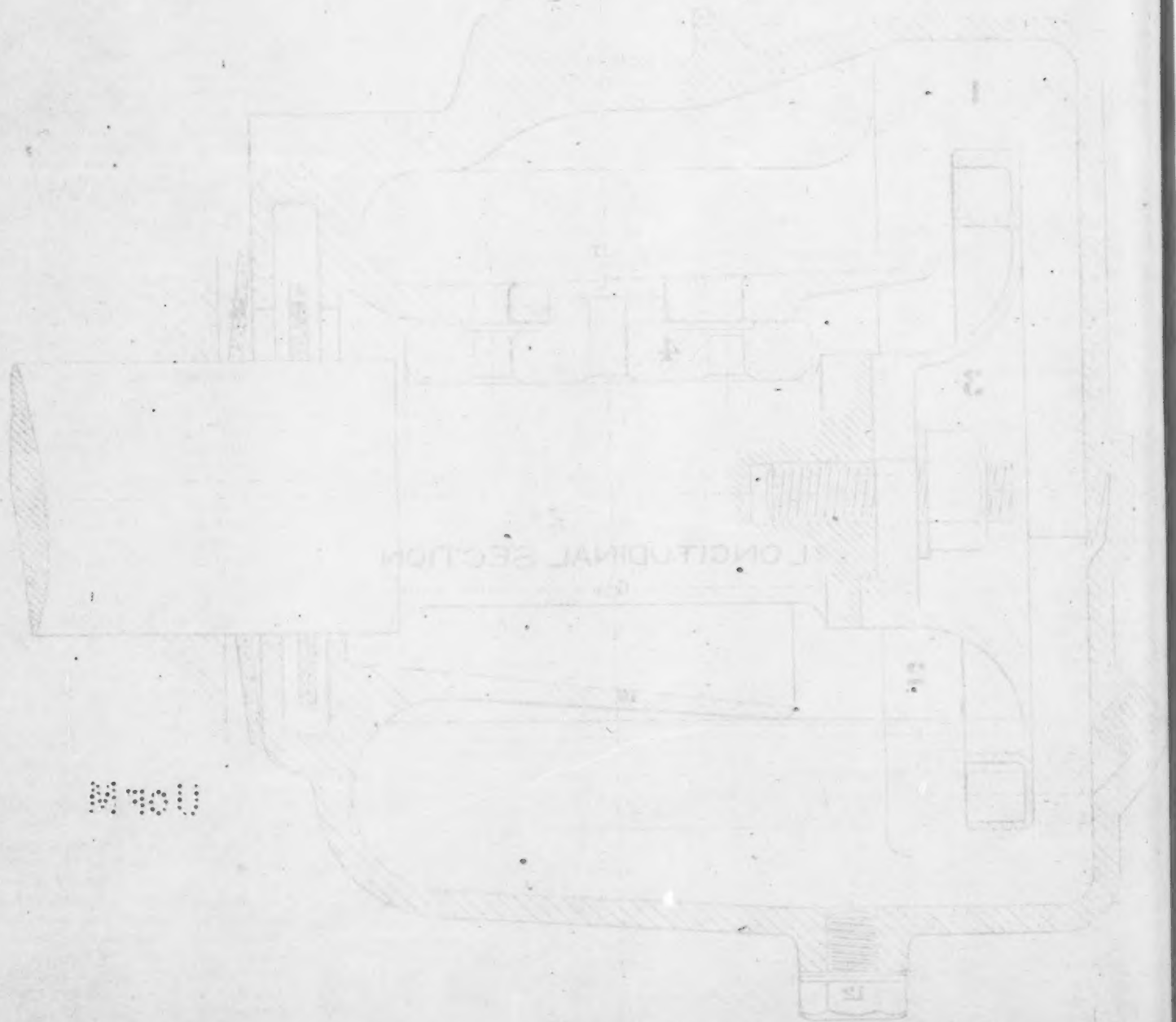




HALF PLAN OF BRASS



UoFM

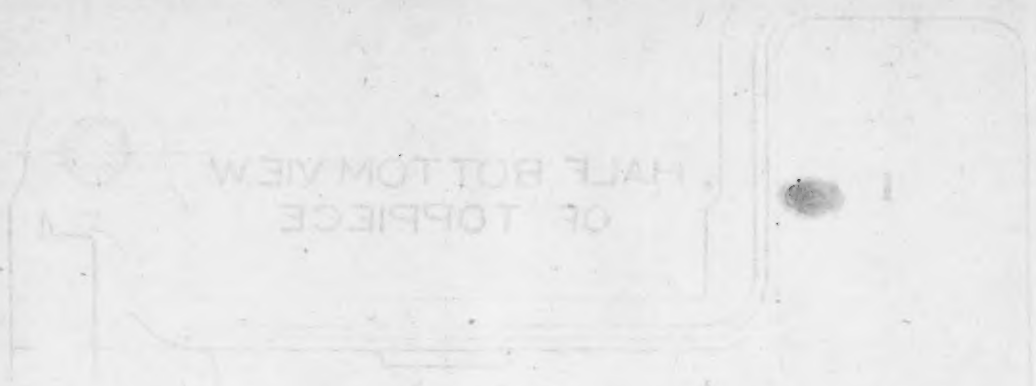


U of M

LONGITUDINAL SECTION



HALF PLAN OF BRASS



HALF BOTTOM VIEW
OF TOP PIECE

year ago, however, by an English corporation, the "Mexican Railway Company," which last January, after many years' work, interrupted by wars and revolutions, completed a railroad from Vera Cruz, the chief port of the Republic, to Mexico, its chief city and center of population and internal commerce. This was an enormously costly work, but it is, to the country, something more than a mere connection between two cities; for it opens a route for the whole interior, heretofore cut off by the steep descent to the plains of the *aguas calientes*, to the sea, which may be readily made the outlet of a great system of railroads of only moderate cost penetrating all parts of the country where there is considerable population and traffic.

Now the cost of the Vera Cruz & Mexico line has been so great, and the returns to those who invested in it so far so small, that there has not been any disposition of capital toward that country for investment in new railroads since Mexico was connected with the sea, though, as we have seen, construction has been made possible by the opening of this route for materials, and will probably not be unusually costly in the districts which now need railroads most.

The growth and prosperity of the country, however, is so dependent upon the construction of such new lines, that, ever since the death of Juarez and the establishment of a degree of order such as the nation has hardly known before since it became independent, there has been an eagerness to secure a railroad system which seems to have raised this question in the popular estimation (if we may believe the Mexican newspapers) to the first rank in the politics of the country. And the inquiry seems to have been, how most certainly and quickly can Mexico obtain railroads? There has seemed absolutely to be no difference of opinion as to the necessity of doing whatever might be necessary to get the railroads; the division has been in opinions as to the best means.

There were last winter, as we have informed our readers, two parties in Mexico offering to undertake the construction of a system of railroads. One of these consisted chiefly of the New York capitalists who are interested in the International & Great Northern and the Houston & Texas Central railroads (including some of the wealthiest men in this country, such as William E. Dodge, Moses Taylor, W. W. Phelps, etc.), and represented by Mr. Edward Lee Plumb, formerly *Charge d'Affaires* of the United States in Mexico, for many years a resident of that city, intimately acquainted with the character of the people and the resources of the country, and personally with a great many of the leading men of the republic. It was called the International Railroad Company of Mexico. The other was the "Union Contract Company," composed chiefly of Philadelphia capitalists, including some Pennsylvania Railroad men, and representing a great deal of wealth. This company was represented last winter by General Rosecrans, and purposed to construct a system of railroads of three-foot gauge.

Near the close of the session of Congress last spring, the administration concluded a contract with Mr. Plumb, for his proposed system, which then had to be submitted to Congress for its approval. That body was supposed to favor the Rosecrans project; but it refused to take the steps required of it in behalf of that scheme, and the session closed with nothing further done than the indorsement by the administration of the Plumb project.

A new Congress met last September, and it soon appeared that the Union Contract Company had not given up the field to its rival, but was ready under the management of Mr. James Sullivan to make new terms, and more acceptable ones; for its new proposal offered to make the lines of its system of the standard gauge if required, thus conforming with the costly line already constructed in Mexico and with the system of the adjoining republic of the United States, with which a considerable interchange of traffic may some day be expected. Soon after the opening of this session a third party appeared upon the scene as a competitor for the contract. This was an association of fourteen merchants resident in Mexico, six of whom are said to be natives and eight foreigners, who are spoken of usually as the "Mexican" company, though they seem to have had no organization in a corporation under a name when competing for the contract. The only persons in this company whose names we have learned are Esteban Benecke, of Esteban Benecke & Co.; Guillermo Barron and David Ferguson, of Barron, Forbes & Co.; Carlos Felix, of Augustin Gutheil & Co.; Messrs. Lascrain, Camacho, Valle, Lizardi and Emilio Velasco.

This week a telegram from Matamoros announces that the contract has been granted to this Mexican company.

The tone of the Mexican papers we have seen would lead one to suppose that nothing could be hoped from a Mexican company, simply because no such company could command or influence the necessary capital. However, we must say that Mexican papers are usually very partisan, and when they oppose a person or a measure they are likely to condemn wholly.

The statement we have seen of the purposes of this Mexican company are contained in an abstract of the contract

which it purposed to make, drawn for the purpose of comparing it unfavorably with another company. According to this the company to be formed will have a board of five directors, three chosen by the stockholders and two appointed by the Government. The system which it purposes to construct is, we understand, very like those of the other two companies, comprising a line from Mexico to the Pacific, a line from Lagos, on the above, to the Rio Grande, and a number of branches to the more important cities; the total length of line is to be 2,621 kilometres, or 1,625 miles. Construction is to be begun within nine months from granting the concession, 62 miles is to be completed within the fifteen months following, and 75 miles each year thereafter, and the whole system completed within ten years. The railroad company is to receive from the Government a subsidy of \$9,000 per kilometre, or \$14,500 per mile, and the right to export free of duty \$800,000 of silver yearly for twenty-five years, there being now an export duty of five per cent. This would add a yearly subsidy of \$40,000 for that period. The payment of the subsidy shall be begun when the company shall have 31 miles of railroad completed, and afterward for every section of ten kilometres (6¼ miles) This subsidy is made payable not in cash, but in a special paper which becomes the sole legal tender for 8 per cent. of all custom-house duties, which is much the same as assigning that proportion of the customs as a subsidy to the railroads. If the whole system shall be finished in eight years instead of ten, the Government is to pay a premium of \$400,000. The gauge is to be the standard 4 ft 8½ inches. The company is to give bonds in the sum of \$400,000 for the execution of its contract within eight months from the time the contract is awarded.

This proposition may have been modified since it was presented; and, indeed, it is not impossible and hardly improbable that the so-called awarding of the contract is nothing more than a report of the Committee on Industry in favor of awarding it to the Mexican company. Our last mails contained the information that the matter was before that committee, which was trying to secure a consolidation of the three companies.

We know absolutely nothing of the Mexican company, but it will hardly be an unwarrantable statement to say that neither it nor either of the American companies would stand any chance at present of securing the necessary capital. Some of the capitalists in one of the companies, and these reckoned the richest, have had their paper protested, and are too busy in asking extensions to think of making or securing advances to new schemes. Mexico will have to wait, we fear; and it seems a pity, too; for the country really seems to be suffering for them, and if order can be maintained as well as it has been for a year back, a judicious and not too costly a system ought to find abundant support. Moreover just at this time, when the trained railroad builders of this country are likely to find very little to do here for some time, it would be very convenient if a field could be opened for their activities in Mexico which can be reached now (the city) in six days from New York. If Mexico can raise the money, it will hardly find a more favorable time for building railroads than now. It would find in this country thousands of eager competitors for the materials and work of construction, and cheaper prices than have been seen on the continent for many a year. But it is with this as with everything else; things are cheap because there is very little money, without which not even cheap things can be bought.

The Costliness of Accidents.

A correspondent, in a letter published elsewhere, inquires whether our railroads can afford to kill and maim the great numbers of people who fall victims to accidents, as reported in our pages. He makes an estimate of the amount paid by the companies for damages to the wounded and to the heirs of the killed, and finds the sum very large. Apart then from any considerations of the sacredness of human life or the duty of carriers to protect the bodies of those entrusted to their care, he puts the question simply as an economical one: whether the money paid on account of the accidents—or lost on account of them, as he would probably include—is not absolutely greater than the expenditure necessary to avoid the accidents altogether, and thus save at once the lives and limbs and the price paid for them. This is one of the first questions to occur to the man who begins to study the subject of accidents, though it is not always put in form. But one can hardly study the subject of accidents and the means of avoiding them without the idea of a debit and credit account in which the cost of provisions against accidents shall be put opposite the cost of the accidents which they prevent.

Certainly if any one has reason to know and lament the cost of railroad accidents it is railroad managers; and scarcely any other person does have an adequate idea of the costliness of wrecks, though it is common enough for men who have occasion to comment on accidents to gravely call the attention of railroad men to the fact that really they would make more money in the long run if they did

not kill or wound anybody. Still it is quite true that railroad managers do not always have a sufficiently keen sense of the cost of accidents, or, indeed, of their responsibility for them; just as most men in other occupations fail to feel sufficiently their responsibilities. They will hardly get it, however, by contemplating the aggregate, so well as by particular cases. There are now doubtless more losses of life in our inland waters, with hardly a tithe of the passenger movement, than on our railroads. Yet railroad accidents are much more talked of, being indeed at once very much more frequent and less fatal. The wreck of the Atlantic sacrificed more lives than all the accidents of all railroads in the United States for a year reported in our record; and we recollect distinctly an accident to a steamboat on the Mississippi River, in 1865, by which four times as many lost their lives. Tons if we simply contemplate the figures, we shall give but a secondary thought to railroad accidents, and give our first and greatest efforts to increasing the safety of those who travel by water. The world seems to have settled down to the feeling, however, that we cannot reach safety in navigation, and that indeed we cannot much improve it, based probably on the experience of generations; though those who know the construction and ordinary management of Western river steamboats doubtless could tell us that there is room enough for such an improvement as would save more men than the railroads kill. But, so far as the railroads are concerned, if not the public, the question is not whether they kill more or fewer people than the steamboats, or even a great many or comparatively few people; but whether they might not kill less. A Sultana may go down with twelve hundred souls, or an *Etna* blow up with a hundred, and these casualties may be entirely preventable: this does not change the responsibility of the railroad company, which is bound to see that it leaves nothing reasonable undone to make its traffic safe. The economy of such a course is not so well taught by a sum of expenses of \$2,300,000 falling upon 70,000 miles of road, making a tax of less than \$35 per mile, or about 0.15 of one per cent. on the average capital, as by such a case as the Revere accident, costing a single company in the neighborhood of half a million, a sum greater than a year's profits to the proprietors; so that a man whose whole fortune was in this company's stock had the equivalent of a year's entire income swept away by that casualty. Railroad officers and stockholders are not so stupid to feel the lessons so conveyed, and the efforts made for safety on some lines may be described as desperate. That they are not wholly successful is quite true, but is no proof of lack of appreciation or lack of effort. It may be in lack of wisdom; but that is a disease which we all die of, nearly—cut off before our time by reason of having done or neglected to do something which we thought indifferent or unimportant.

While there is great room for improvement in the safety of railroad traveling in this country and elsewhere, it is not likely that such improvement will be very sudden or rapid. This work is one which requires something like the development or growth of a nation or class. We are inclined to think that a severer discipline of the working staff of a railroad would do more than any other thing to eliminate accidents; and yet to introduce and maintain such a discipline would be almost like a revolution, upsetting the habits and practices of not the single class of railroad men alone, but the whole nation as it were, which has got into the habit of doing its work in a sort of free and easy way, likes its way and kicks lustily against any effort to make it take up another. Our so-called disciplined bodies, such as our police and fire departments, are examples of this, and almost the only notable exception is our regular army, which is hardly large enough to make any impression; while our volunteer army during the late war was a striking illustration of the national habit to be impatient of strict rules and prefer individual short cuts towards common ends. This does not prevent our having extremely efficient bodies for certain purposes; and our armies during the late war have no reason to be ashamed of their record. But it is an obstacle to the perfectly smooth working of a large and complicated body, where unhesitating and unquestioning obedience and minuteness of drill may often prevent fatal complications.

We conclude, therefore, not that a large proportion or the largest proportion of our railroad accidents are unavoidable, but that under the circumstances they will not be avoided by any sudden movement or simultaneous act. Doubtless we shall always have them, and our fight against them is very much like the fight against sin: we may hope to keep it down somewhat and here and there drive it pretty well out of sight for a while, but we are hardly sanguine enough to expect to put an end to it in this stage of existence. But we all make rather faster progress with the railroads, we trust, so that looking back a decade we may see that we have made progress;—and hardly less than a century will do with the spirit of evil, and with that it is not always quite possible to discern the progress, or be sure that it has not been backward. Indeed, there is a

not imaginary connection between the two; and when we shall have officers fully alive to their duties and responsibilities, and men perfectly faithful and devoted, we shall report a very much smaller list of accidents than we now do, towards which consummation let us all lend a hand.

The Abolition of Commissions.

At the special meeting of the Railway Association of America in Chicago, last week, seventy-nine railroad companies were prepared to enter a combination to bind themselves, under penalty of serious disabilities, to put an end to all payments of commissions for selling tickets, and not one opposed the movement. An agreement was drawn up and is now being signed, and there seems every probability that it will be entered into by every company at least whose refusal to join might cause serious injury. This week the New York Central & Hudson River Company signed the compact. Its adhesion had been considered doubtful, as it has left the sale of its tickets in the city of New York very largely to outside agents, and is not so well provided with facilities of its own as some of its competitors. The Grand Trunk gave its adhesion in Chicago, through its President, Mr. Potter, who happened to be in this country. The Western roads are united and eager for the enforcement of the measure, and are ready to refuse all facilities for exchanging business over any road that holds out. The falling off of travel and the necessity of severe economy make managers more than usually anxious to prevent any diversion of receipts from the companies' treasuries, and there is no doubt that a considerable saving can be made, which will be nearly all clear gain, by ceasing to pay commissions.

Piret's Axle Box.

The lithograph on colored paper which we publish with this number of the GAZETTE represents a French invention which has been introduced into this country. It consists of a circular disc, 3, attached to the end of the axle for the purpose of raising the lubricating fluid from the chamber or reservoir at the bottom of the box to an upper reservoir, 7, above the journal-bearing. From this upper reservoir the fluid then runs down upon the journal through openings in the bearing. In this way the journal is kept in a constant state of perfect lubrication.

The disc, 3, has chambers—shown by the dotted lines in the half-front view, which will take up the oil when the car is running either way. When the buckets or chambers in the disc have revolved to a height equal to two-thirds of the diameter of the disc, the oil or other fluid is discharged at an angle of 27 degrees into the upper reservoir, 7.

The box is constructed in two parts, with the joint near the center of the axle, as shown in the illustration. A lip, 9, is cast on the upper half to prevent the oil from leaking out at the joint. In the lower half an apron or deflector, 10, is cast to prevent the oil from being dashed against the axle and escaping at the opening through which the axle is inserted into the box. The inside washer, 5, is intended to prevent the oil from escaping, and the outside washer, 6, to exclude the dust from the box.

The opening marked 11 is for feeding the box with oil, and 12 is the outlet for cleaning it.

The brass, 4, is cylindrical in form at the center, so as to allow the brass to swing around a perpendicular line and thus adjust itself to inequalities of the track or construction of the car.

The following are the claims made by the company which controls the patents on this invention:

"The merits of this improved box are such that it can accomplish a journey of over 30,000 miles on a railroad, at the highest rate of speed, under the heaviest of loads, with the same oil and without heating, and is so contrived that the oil cannot escape.

"It can be completely emptied on the spot, cleaned out and refilled in less than a minute, without raising the car.

"It considerably diminishes friction, does away with the cotton waste, keeps the wheels of the car completely clean, and dispenses with much manual labor.

"It prevents the wearing out of brasses and makes the traction more easy, from the fact that the lubricating matter is always flowing over the bearings, and never comes in contact with dust and grit, which are entirely excluded by means of the simple contrivance of two patent centrifugal washers, of which one is placed inside the box and one outside, between the box and the wheel.

"The above immense advantages permit of companies employing the whole of their rolling-stock, whereas with other systems of boxes in use up to the present, 10 per cent. of the cars are always under repair or in the shops to be cleaned through the burning up of the waste, and the wear of the axles and brasses, caused by insufficient lubrication and the accumulation of sticky matter produced by the presence of grit which wears the metal, and the residue mixes with the oil, thereby rendering the traction extremely costly and difficult, for the motive power must be increased to counteract the friction.

"This box can be made in any form so as to fit with facility on all railway axles, and can be adapted for any mode of attachment, without making any change whatever in the cars of railway companies."

The name and address of the company is the Piret Lubricating Box Company, No. 29 Broadway, New York.

The Chicago & Lake Huron Railroad.

The European Administrations Comptoir for American Railroad Securities has reported to the bondholders of the Peninsular Railroad Company concerning the policy which it is advisable for them to take. There are \$1,800,000 of 7 per cent. bonds outstanding on the Michigan section, on which coupons for two years are unpaid, making \$504,000 overdue for interest,

Of the \$2,000,000 loan on the Michigan, Indiana & Illinois section, \$705,000 was sold absolutely, \$1,000,000 has been deposited with the Continental Improvement Company and the Pennsylvania Company as a pledge for the payment of \$450,000 due these companies for work done, \$274,000 is in the hands of S. W. Hopkins & Co., as security for debts due that firm, and \$21,000 in the hands of Crerar, Adams & Co. The report of the Administration says that if the mortgage should be foreclosed the holders of these pledged bonds would come in for their full proportion according to the face of the bonds in their hands, while there are some floating debts which are prior to the mortgage. The Administration believes it to be for the best interests of the bondholders to endeavor to secure the completion of the road as a through line from Chicago to a connection with the Grand Trunk and the Great Western of Canada at Port Huron. This is already provided for on the east by a contract for consolidation with the Port Huron & Lake Michigan Railroad, which has been for some time in operation from Port Huron west 66 miles to Flint. On the west a contract made with the Pittsburgh, Fort Wayne & Chicago Company gives it the use of that road from the western terminus of the Peninsular road at Valparaiso, Ind., into Chicago, a distance of 44 miles. There is then in operation of this line the 44 miles of the Port Wayne road from Chicago to Valparaiso, the 165 of the Peninsular from Valparaiso to Lansing, Mich., and the 66 of the Port Huron & Lake Michigan from Port Huron to Flint, Mich. The gap between Lansing and Flint is but 50 miles long, and the two last-named companies have made a contract of consolidation under the name of "Chicago & Lake Huron," and will endeavor to complete this gap, after which there will be no obstacle to the running of trains through between Chicago and Port Huron, and such a connection with the Great Western or Grand Trunk or both as will enable freight and passenger cars to run through by this route between Chicago and New York and Boston, as they now do by the Michigan Central and the Lake shore routes, with which it would be a direct competitor. From Chicago to Port Huron the distance will be 325 miles by this route, and to Buffalo 521 miles, which is as short as any other route, or nearly so.

The Administration has made a contract with the Chicago & Lake Huron Company, which postpones the payment of all coupons until May, 1878, in consideration of which the company agrees to pay 6 per cent. interest on the coupons after they become due, to pay the debts which are prior to the mortgages, to relieve the \$1,000,000 pledged for the debt of \$450,000, and to complete the line by constructing the section between Flint and Lansing before the end of 1875. Mr. L. H. Meyer, of New York, is made Trustee for the bondholders under this agreement.

As this line is so nearly completed and will be made so much more valuable by completion, there being two good connections eastward with one or the other of which intimate relations can doubtless be established, it seems wise that great efforts should be made to finish this line, when it will be comparable as a route for through traffic with the Michigan Central, or the Lake Shore's line from Chicago to Toledo. It will probably also be used to give a Chicago connection to the Grand Rapids & Indiana.

Record of New Railroad Construction.

This number of the RAILROAD GAZETTE has information of the laying of track on new railroads as follows:

Rhinebeck & Connecticut.—Extended from Jackson Corners northeastward 8 miles to Mount Ross, N. Y. *Rochester & State Line.*—Track is laid from Rochester southwestward 12 miles to Scottville, N. Y. *Western Maryland.*—Extended from Hagerstown southwest 7 miles to Williamsport, Md. *Marietta & Pittsburgh.*—Extended north 5 miles to Liberty, Ohio. *Toronto, Grey & Bruce.*—Extended from Mount Forest southwest 10 miles to Harrison, Ont. *Green Bay & Minnesota.*—Extended southwest 8 miles to a point within two miles of the junction with the La Crosse, Trempealeau & Prescott. *Texas & Pacific.*—The Transcontinental Division has been extended 4 miles to Honey Grove, Texas. *Walla Walla & Columbia River.*—Extended westward $4\frac{1}{2}$ miles to a point ten miles west of Walla Walla, Oregon.

This is a total of 58 $\frac{1}{2}$ miles of new railroad, 10 of it being in Canada, and the total completed in the United States in 1873 is 3,276 $\frac{1}{2}$ miles.

RAILROAD BUILDING IN NORTHWESTERN NEW JERSEY, hitherto a somewhat secluded region, promises to be pretty active for the next year or two. Until the opening of the New Jersey Midland and the Montclair last year the only railroad lines in all that part of the State lying north of the Morris & Essex and west of the Erie, comprising the upper portions of Bergen, Passaic, Morris and Warren counties and the whole of Sussex, were the Sussex road and a short line used to carry iron ore from the Ogden Mine to the Morris Canal. Just now four projects are on foot, two of which give considerable promise of success. These are the New Jersey Midland's Belvidere Branch, for which surveys have been made and some money raised; the South Mountain & Boston, on which work has been commenced; the Pequest & Walkill, an old project long believed to be dead, but which has recently shown signs of life; and a fourth line, the Lehigh & Eastern, running up the Delaware valley, for which surveys were lately made. This section of New Jersey is a rough and hilly, but fairly fertile country, specially adapted to stock and dairy farming, which, indeed, is the chief industry of a considerable portion of it, while the hills in many places are rich in iron ore. The iron mines, though long known (some of the oldest, if not the oldest, furnaces in the United States have been in this region), have not been very largely worked until lately, with the exception of a few lying near the Morris Canal. The country is intersected by numerous valleys, all trending from southwest to northeast. The New Jersey Midland crosses

most of the water-courses, and is therefore a pretty expensive road, with heavy grades and many curves, but the new lines all follow the valleys. Some of these projected lines result from the great development of the iron business of the region during the last four years, but one at least—the South Mountain & Boston—is intended to be part of a line which is to extend from the anthracite region of Pennsylvania to a connection with the New England roads over the proposed Poughkeepsie Bridge. It is a section capable of considerable growth and development, and it seems as if one or two of the projected lines, if built, might in a few years secure a considerable and fairly profitable business.

THE CHICAGO & NORTHWESTERN, whose stock has been so greatly depressed since the panic, reports that its net earnings for the first four months of its fiscal year, ending with September, were \$1,356,000, which is at the rate of 11 per cent. per year on all its common and preferred stock, above all interest and other prior charges, and also above an improvement of the track by putting in 10,000 tons of steel rails. It will not be necessary for the road to keep up this rate of earnings in order to make the stock worth nearly twice as much as it has brought sometimes since the 18th of September, but the road, and its neighbor, the Milwaukee & St. Paul, are of those which are likely to be least affected by the panic. For the chief eastward business over their lines is wheat carrying, and the chief westward business carrying the materials which wheat has bought; and this year the wheat crop is unusually great and the demand quite equal to the supply, so that there is almost sure to be an unusually heavy movement over these roads until after the next harvest.

THE MILWAUKEE & ST. PAUL RAILWAY, by entering into close working relations with the Milwaukee & Northern and Wisconsin Central railroads, (which had just agreed upon terms of union,) practically makes these lines parts of its great system, for the present at least. This gives it a line nearly straight from Chicago north through Milwaukee to Green Bay only 195 miles long, against 213 by the new line of the Chicago & Northwestern, and 242 miles by the old route, or "Wisconsin Division," and what may for the present be termed a branch of the same from a point 168 miles north of Chicago northwestward 158 miles, which is to be extended (the work on the road-bed being in large part completed) north to Lake Superior, penetrating a lumber region which has no railroad or other route for transportation for 125 miles on either side of this road. The completion of about eighty miles more will finish the line to Ashland, when there will be a continuous line worked as one route (if the present arrangement shall be continued) from Chicago through Milwaukee, Menasha and Stevens Point to Lake Superior at the magnificent harbor of Ashland Bay, one of the few really good and capacious harbors on the Great Lakes; and this route will be 435 miles long, giving Chicago and Milwaukee access to the west end of Lake Superior and its iron ore deposits as they now have access to the Marquette iron districts at the middle of the south shore through the Chicago & Northwestern. The Milwaukee & St. Paul will at once begin to run trains through between Chicago and Green Bay, thus competing with the Northwestern for the business of the great lumber district about Green Bay, and opening a considerable new district east of Lake Winnebago and the Fox River. The new lines nowhere come in contact with the Milwaukee & St. Paul's own lines, and are well situated to form a harmonious part of its system.

IMPROVED CATTLE TRUCKS, or stock cars, as the American railroad language has it, are desired by the British "Royal Society for the Prevention of Cruelty to Animals," which offers a premium of £100 for a new design, a similar premium for alterations of or additions to the present English design, and an additional £100 to each prizewinner "so soon as he shall have induced a railway company to build fifty of his improved trucks, and to bring the same into actual use on their line for the transport of cattle." The requirements are that the car shall be roofed, provided with buffers and springs to lessen the shocks in starting and stopping and otherwise, and with arrangements for feeding and watering the animals in the car, either when the train is in motion or while standing at a platform or siding; and it must not cost very much more than the cars now in use and be acceptable to the judges, who are named, and are thirteen in number, including one member of the Central Chamber of Agriculture, one railroad chairman, one gentleman from the Royal Engineers, the Chairman of the "Cattle Defense Association," a cattle salesman, a professor in an agricultural college, a manager of car-building works, a veterinary surgeon and a civil engineer. Any enterprising Yankee who may wish to present his scheme may address Mr. John Colam, the Secretary of the Society, at No. 105 Jermyn street, St. James, London; but we warn him beforehand that long cars on trucks, such as we use here, will not be likely to receive much attention.

THE NORTHERN PACIFIC REPORT telegraphed from Washington seems to cover the year ending with June last, when it could hardly be said that any of the road west of the Red River of the North had been open for traffic; at least the traffic on the forty miles on the Pacific coast and the two hundred miles between Moorehead and the Missouri River must have been a mere trifle before that time. So the \$547,100 reported as earnings we will assume to have come wholly from the 252 miles in Minnesota, making a return of \$2,171 per mile of road. The brief telegram does not state the working expenses; but the bonded debt at that time is given as \$25,517,925, or something more than \$50,000 per mile of road then completed, besides a floating debt of about \$5,000,000. These figures, however, come by telegraph, and we will not pin our faith to them. Counting a gross income of \$2,171 per mile, and an interest

charge of \$3,650 per mile, it must require extraordinary ingenuity and magnificent economy in working to make the former cover the latter.

THE BELGIAN STATE RAILROADS have a larger proportion of rolling stock than any others, the number of freight cars per mile being no less than 22%, yet the complaints of insufficiency of accommodations for shippers are constant and bitter every winter. A Belgian writer says that the stock of cars is so unskillfully managed that while the average trip is less than forty miles, requiring but a few hours for the movement, the average time employed in loading and unloading and waiting to get upon the road is no less than three days. Out of 22,000 freight cars owned by the State he estimates that an average of 15,000 are on sidings all the time. He concludes that the only practicable way to relieve transportation is to improve station service, as any further increase of cars without such improvement would simply block the stations and sidings worse than ever.

THE AMERICAN BAGGAGE CHECKING SYSTEM, we are informed, has been introduced upon the Midland Great Western Railway of Ireland by Mr. J. E. Ward, the Traffic Superintendent, and there are reports that it will be used also on the train of Pullman cars which is to be run between London and Edinburgh.

NEW PUBLICATIONS.

Elements of Physical Manipulation. By Edward C. Pickering, Professor of Physics in the Massachusetts Institute of Technology. Royal 8vo, pp. xii. and 225. Published by Hurd & Houghton, New York.

This book, as set forth in its preface, is intended to be used in connection with the laboratory system of teaching physics. The first twenty-seven pages are devoted to a discussion of the general methods of physical investigation, including both the analytic and graphic, of estimating errors and arriving at results, with notes on physical measurements. The author, presupposing an accompanying course of lectures on these subjects, touches lightly on them, the most valuable portion of the discussion being references to other authorities—which, however, are not so complete as desirable.

The remainder of the volume describes the apparatus and manipulations employed in making ninety-four experiments in measuring; Dynamics, including solids, liquids and gases, sound and light. The text is generally sufficiently clear, though Experiment 7, on the eccentricity of graduated circles, is ambiguous.

The wood-cuts illustrating the experiments are not creditable to the Riverside Press, notably the cut of the Bunsen Photometer.

A second volume on Heat, Electricity, a list of books of reference, and other matters of general interest to the physicist, is promised at an early date.

Judging from the present volume, the two will be of great value for the purpose for which they are designed, and of interest to all students of physics.

General Railroad News.

OLD AND NEW ROADS.

Portland & Ogdensburg.

It is stated that an agreement has been finally completed between this company, the Eastern Railroad Company and the Montreal, Chamblé & Sorel, by which a new line is to be completed from Boston to Montreal. This line is to be formed by the Eastern Railroad and its Portsmouth, Great Falls & Conway line from Boston to North Conway, N. H.; the Portland & Ogdensburg from North Conway to Sheldon, Vt.; and the Montreal, Chamblé & Sorel from Sheldon to Montreal. The uncompleted portions of this line are on the Portland & Ogdensburg from Upper Bartlett, N. H., through the White Mountains to the Connecticut River, 38 miles; on the Vermont Division from West Concord to the Connecticut River, 10 miles, and from Hyde Park to Sheldon, 30 miles; and on the Montreal, Chamblé & Sorel from Sheldon to Chamblé, 45 miles. The agreement, it is said, provides that all the Boston business of the Portland & Ogdensburg shall be turned over to the Eastern at North Conway, in return for which the Portland & Ogdensburg is guaranteed "a large share of the gross earnings of the whole line." This means probably that the Eastern gives the Portland & Ogdensburg a "traffic guarantee," by agreeing to invest a proportion (such as 40 or 50 per cent.) of the gross earnings of the traffic which it receives from and delivers to the Portland & Ogdensburg in the bonds of the latter company at par. The Eastern's line extends nearly due north from Boston to Conway, and in connection with the other roads it will make quite a direct route—as short perhaps as any other from Boston to Montreal. It is thought that the new sections can be completed next season.

Bingham Canon.

The grading is completed to the terminus, six miles beyond the present end of the track. The iron for this section has been received, and track-laying has been commenced on this section. The ties are all in place, and only a few days will be required to complete the work. A very large quantity of ore is ready for transportation as soon as the road is completed.

Connecticut & Passumpsic Rivers.

The passenger equipment of this road is being fitted with the Westinghouse brake.

Galveston, Harrisburg & San Antonio.

Trains on this road commenced running to Weimar, fifteen miles west of the old terminus at Columbus, Texas, November 17th. The change of terminus seems to have had a depressing effect on Columbus, for the company advertises that no freight will be hereafter received for Columbus, there being no merchants there to receive it.

Hoosac Tunnel.

The Boston Advertiser of November 21 says:

"A letter from Mr. Walter Shanty to Hon. Robert Johnson, under date of the 18th instant, states that the Hoosac Tunnel will probably be opened through on the 28th instant. The Shantis have until September 4, 1874, to complete the enlargement and grading of the tunnel, and the laying through of it of one line of track, and the removal of all material, etc. It is probable, however, that the tunnel will be opened for travel on the 4th of July next, that being Governor Washburn's de-

sire. To do this it will be necessary to timber the tunnel at certain points where demoralized rock was encountered in boring, as a temporary expedient, leaving the permanent brick arching of those places to be done after the opening. It is the choice of the engineers to delay the opening until this permanent arching is completed, but it is uncertain which course will be adopted."

Preparations were made which were expected to insure the opening through on the 27th.

St. Paul & Sioux City.

The township of Mankato, Minn., has voted a bonus of \$5,000 to this company in aid of the construction of the Blue Earth City Branch.

New York, New Haven & Hartford.

Thirty-five of the truss and pile bridges on the Shore Line Division between New Haven and New London have been entirely rebuilt, leaving five yet to be finished. These, it is expected, will be completed before the setting in of the winter storms.

Western North Carolina.

The Statesville (N. C.) American, of a recent date, says:

"We learn that the Western North Carolina Railroad has been purchased by the North Carolina Railroad, and hence the two roads will be consolidated, which will insure the completion of the former west to the State line at the earliest practical day. The contract for this was made by the North Carolina road, of which Major W. A. Smith is President, and Receiver of the Western, in New York, last week, by transferring to the North Carolina road the bonds, judgments, etc., held by the Southern Security Company and R. Y. McAden, Esq."

"We understand that Governor Caldwell and the State authorities are all earnestly in favor of the early completion of the above road. The directors of the East Tennessee, Virginia & Georgia Railroad at their last meeting ratified the action of their officers in transferring their interest in the above road. The State of North Carolina has some 500 convicts in their State Prison who are to be put upon the road. There will be very little money needed to finish that end of the line to the Tennessee line. The road from Morristown will meet them the day they get there."

The road is now in operation from Salisbury, on the North Carolina road, to Old Fort, 114 miles. About 60 miles of road will be required to reach the Tennessee line. The road has been in litigation some time.

Washington County.

It is proposed to extend this road from Hagerstown, Md., northeast about 15 miles to Waynesboro, Pa., there to connect with the Harrisburg & Potomac road, now under construction. The Washington County road is now 24 miles long, from the junction with the Baltimore & Ohio 79 miles from Baltimore, north to Hagerstown.

Dakota Southern.

The officers of this company deny the truth of the report that the road was about to be sold or leased to the Illinois Central Company.

Baltimore & Swann Lake.

The construction of this narrow-gauge suburban line is proceeding slowly, owing mainly to difficulty in securing the right of way. Several parties, whose land is to be taken, have appealed to the courts.

Towsontown & Swann Lake.

The grading of this narrow-gauge line, which is to be a branch of the Baltimore & Swann Lake, extending from that road near Swann Lake to Towsontown, is nearly completed. The grading will be finished up, but the rails will probably not be laid until the completion of the Baltimore & Swann Lake road.

Boston & Albany.

The proposals for the new issue of \$1,000,000 in bonds were opened in Boston, November 19. The offers amounted to \$1,200,000, but only \$500,000 were accepted, the company having decided to accept no bids at less than par.

Vermont & Massachusetts.

This company and the Fitchburg have failed to settle on a basis for consolidation. The Fitchburg Company offered to leave the terms of union to referees, but the Vermont & Massachusetts declined this proposition and the Fitchburg withdrew all offers.

Boston, Barre & Gardner.

Work has been resumed on the extension to Winchendon, and it is expected that the road will be completed by the close of the year.

Norfolk & Bristol.

A company by this name has been organized at Walpole, Mass., to build a railroad from Dedham, Mass., south by west to Attleboro, on the Boston & Providence road. The road will be about 18 miles long. The capital stock is to be \$350,000. The road is to be leased to the Boston & Providence Company when completed.

Maryland & Pennsylvania.

A large force is at work on the grading of this road between the Relay House on the Northern Central road and the Gunpowder River. It is said that track is to be laid at once from the Relay House to Towsontown, some three miles. Work is also going on northeast of the Gunpowder. The road is to extend from Baltimore northeast to the Pennsylvania line, in the direction of Philadelphia.

Alexandria & Fredericksburg.

The bridge over the Occoquan River has been repaired, and trains are now running regularly over the road.

Roanoke Valley.

Work on this line from Clarksville, Va., north to Keysville, on the Richmond & Danville road, has been suspended, owing to the impossibility of disposing of the bonds at the present time. The contractor, Mr. Harvey, has offered to finish up a part of the line ready for use, if the company will allow him to draw on the funds deposited as security for the fulfillment of the contract.

Mississippi Central.

The trouble with the contractors on the Cairo Extension has been settled, and the work is now being pushed forward rapidly.

Dividends.

The Ohio & Mississippi Railway Company has declared a semi-annual dividend of 3¼ per cent. on the preferred stock, payable December 1. The dividend is payable in scrip, the scrip being payable March 1, 1875, and bearing 7 per cent. interest.

The American Union Express Company has declared a semi-annual dividend of \$3 per share, payable January 2, 1874.

Lake Ontario Shore.

The Lockport (N. Y.) Journal of October 19 says: "We learn to-day that the board of directors of the Lake Ontario Shore Railroad Company had a meeting at Oswego this week, and made a conditional lease of this road to an organization recently formed for the purpose of constructing and operating a line of railroad from Boston to the Niagara River, embracing

not only the Lake Shore line, but some New England roads, passing through the Hoosac Tunnel and filling up the space from that tunnel to the Lake Shore road, intersecting it at a point in the town of Hannibal, a little west of Oswego. This lease is not to take effect until the road is fully completed by the present company, and in no case until the conditions of the lease are fulfilled."

Salem & Vineland.

It is proposed to construct a railroad from Elmer, N. J., the junction of the West Jersey and Salem roads, southwest to Vineland, there to connect with the New Jersey Southern. The road would be about 12 miles long, and would pass through a good section of country.

Rhinebeck & Connecticut.

The track is laid to Mount Ross, N. Y., eight miles beyond the late terminus at Jackson Corners and 25 miles northeast of Rhinebeck. The work is progressing steadily, and it is expected that the track will reach Ancram within a week.

Utica, Ithaca & Elmira.

There is a report that this company will lease and operate that portion of the New York & Oswego Midland's Auburn Branch from Freeville to Scipio Center, 26½ miles. This could very well be worked in connection with the Utica, Ithaca & Elmira.

Rensselaer & Saratoga.

The trouble between this company and the Harlem Extension has been temporarily settled. An agreement has been made by which the Rensselaer & Saratoga trains will be allowed access to the yards and shops at Rutland over the Harlem Extension track as heretofore. This agreement is to hold until January 1, 1874, by which time it is probable that some permanent arrangement will be made.

Montpelier & Wells River.

The ballasting is being completed, and it is probable that trains will be running over the whole line by December 1.

Marietta & Pittsburgh.

Trains now run from Marietta, O., through to Liberty, 15 miles north of Cambridge, the late terminus, and 73 miles from Marietta. Work is proceeding steadily on the road.

Poughkeepsie Bridge.

The Poughkeepsie Eagle announces that Mayor Eastman of that city has returned from Philadelphia with the information that the plans and specifications for the bridge across the Hudson at Poughkeepsie have been completed, and engineers will this week locate the land piers and commence the excavations and masonry work, and when the river is frozen sufficiently work will be commenced at other points. The plans adopt the highest grade, which will allow of wagon way under the railroad track and will add in every way to the strength and grandeur of the structure. It also gives a very favorable grade line for the connecting railroads on the west shore. It is expected that sufficient work can be done soon to allow of the laying of the corner stone by the middle of December.

Ground was broken and a force set at work on the first land pier November 26.

New Haven, Middletown & Willimantic.

In the suit brought by this company to compel the selectmen of the town of Chatham, Conn., to issue \$40,000 in bonds voted to the road, the court has decided in favor of the company. This decision will probably also apply to the towns of Middlefield and Hebron, which voted bonds, but have not yet issued them.

Meetings.

The annual meeting and election of directors of the Pittsburgh, Washington & Baltimore Railroad Company will be held in Pittsburgh, Pa., December 1.

The annual meeting and election of the Atlantic & Great Western Railroad Company will be held at the office of the company, No. 74 Wall street, New York, December 8.

The annual meeting and election of the United States Rolling Stock Company will be held at the office of the company, No. 74 Wall street, New York, December 8.

The thirty-eighth annual meeting of the Wilmington & Weldon Railroad Company will be held in Wilmington, N. C., December 10.

Albany & Susquehanna.

The lessee of this road, the Delaware & Hudson Canal Company, has purchased property at Sidney Plains, N. Y., the crossing of the New York & Oswego Midland road. New repair shops are to be built at that place, and the shops now at Oneonta, will be removed to Sidney Plains.

Wilmington & Reading.

The grading of the extension from Birdsboro, the present terminus, to Reading is nearly completed, and track-laying has been commenced from both ends of the line. It is believed that the road will be completed in a month. The extension is about nine miles long.

Coal Hill.

A company by this name has been organized to build a branch road seven miles long from the Evansville & Crawfordsville road in Curry township, Sullivan County, Ind., to Coal Hill. The capital stock is to be \$200,000, and the incorporators are Chauncey Rose, N. Thomas, Charles R. Fiddle, Josephus Collett, Demas Deming, Wm. K. Edwards, and John C. Martin.

Walla Walla & Columbia River.

The first ten miles of this road is completed and regular trains are now running. Work on the road is being pushed forward. The road when completed will extend from Walla Walla, Oregon, west about thirty miles to the Columbia River at Wallula.

Toronto, Grey & Bruce.

The extension from Mount Forest, Ont., to Harriston, 10 miles, is completed and was opened for traffic November 15. At Harriston connection is made with the Wellington, Grey & Bruce road.

Rochester & State Line.

The track is laid from Rochester southwest to Scottsville, about 19 miles. A temporary engine-house has been put up at that place. The work of ballasting the track has been commenced, extensive gravel beds being reached near Scottsville. It is hoped that track can be laid to the crossing of the Auburn Branch of the New York Central before winter sets in. There is plenty of iron on hand, and the rails are being laid down as fast as possible.

Taunton Car Company.

The paint and blacksmith shops of this company at Taunton, Mass., were destroyed by fire November 23. The estimated loss is \$40,000, which is covered by insurance.

Pittsburgh, Wheeling & Kentucky.

This company has been obliged to stop work for the present. The grading of the line from Wheeling north to the junction with the Pittsburgh, Cincinnati & St. Louis road, some 23 miles, is so nearly completed that it is stated that \$30,000 will complete the work according to contract. The company has received subscriptions of \$240,000 from Ohio County, W. Va., and \$115,000 from Brooke County, besides \$20,000 in private subscriptions. It is moreover stated that the Pittsburgh,

Cincinnati & St. Louis Company, which has agreed to iron and equip the road, would not be able to do it this fall, even if the grading were completed according to contract.

New York & Oswego Midland.

It now appears that on application of some parties having small claims against the company, Judge Pratt, of the New York Supreme Court, has appointed Mr. Eugene H. Pomeroy, a New York lawyer, Receiver of this road. It is not easy to see how this new Receiver can do anything, the road being already in the possession of the Receiver appointed by the United States Circuit Court. It is not probable that this appointment will amount to anything.

It is stated that Col. J. G. Stevens, recently appointed Receiver jointly with Mr. Hewitt, will take upon himself the immediate control and management of the road. Mr. Stevens has had much experience in railroad management.

Arrangements have been made for an exchange of business with the Erie Railway at Middletown. It is reported that the present relations with the New Jersey Midland are not very friendly, which report seems rather doubtful. When the Erie's gauge is changed it will be able to take the New York & Oswego Midland's traffic into New York should the latter break with the New Jersey Midland.

Work on the new round-house at Middletown, N. Y., has been stopped, for want of material.

Wellington, Gray & Bruce.

The first passenger train over the Southern Extension arrived at Kincardine, the terminus, November 12. The Southern Extension leaves the main line at Palmerston, Ont., 70 miles from the junction with the Great Western, and runs southwest 15 miles to Newry, and thence northwest, nearly parallel with the main line, to Kincardine, on Lake Huron. It is 66 miles long.

Bangor & Bucksport.

It is stated that arrangements have been made by which work will be commenced early in the Spring. The weather will prevent any continuation of the work this season.

Buffalo & Jamestown.

Some uncertainty exists as to the future action of this company in view of the abandonment of the Oil Producers' Railroad, which was to constitute the southern section of the line. The town of Jamestown has appointed a committee to confer with the company and see what action is necessary to secure the completion of the road to that place.

St. Louis & St. Joseph.

In the United States Circuit Court at Jefferson City, Mo., November 20, a decision was rendered in the case of Hudekoper against Buchanan County, Mo., which involved the validity of \$400,000 in bonds, issued in aid of this road by Buchanan County. The court decided that the bonds were valid and the interest must be paid. One year's interest (10 per cent.) is now due.

Pacific, of Missouri.

The United States Circuit Court has decided in favor of the validity of the bonds issued by the city of Pleasant Hill, Mo., in aid of the construction of the St. Louis, Lawrence & Denver road, which forms the Lawrence Branch of the Pacific road.

Vermont Valley.

In the suit of George B. Chase and others against this company an injunction has been granted to prevent any interference with the road or property (which is now in possession of the Central Vermont Company, under the lease made to Page and Birchard in 1865) until further order is made by the United States Circuit Court. The effect of this decision is to keep the road in the hands of the Central Vermont Company until the expiration of the lease, June 1, 1875. The injunction, however, does not affect the suit of Grinnell and others against the Vermont Valley Company, which is pending in the Court of Chancery for Windham County, Vt.

Southern, of Canada.

Arrangements have been completed for the consolidation of the Montreal, Chambly & Sorel and the Missisquoi Junction Railway companies into one company by the name of the Southern Railway Company of Canada. The road will extend from Montreal, Can., east by South to Chambly, on the Richelieu River, and thence southeast to Franklin or Sheldon, Vt. The rails are laid from Montreal to Chambly, some 12 miles.

Texas & Pacific.

Trains on the Trans-continental Division are now running regularly from Sherman, Texas, east to Honey Grove, 45 miles.

Selma & Gulf.

In his annual message recently published the Governor of Alabama says:

"It was believed that a purchaser was found for the Selma & Gulf Railroad, on terms that would indemnify the State, and advertisement was accordingly made to complete the title to the same by a sale under the mortgage to the State for the \$40,000 loaned said road. But all this has been postponed by unavoidable causes, so that its consummation has not been effected. That road is now in the hands of receivers, appointed by the Selma Chancery Court, and is sought to be subjected to a lien of certificates to be issued and disbursed by the receivers, whose lien will be paramount to the lien of the first mortgage bonds. I have instructed the attorneys for the State to resist this step in every legal manner."

South & North Alabama.

In his annual message the Governor of Alabama states that this company has canceled its bonds indorsed by the State to the amount of \$3,632,000, which have been disposed of as the law directs, and is now entitled to the benefit of the act to provide for the substitution of State bonds, to the amount of \$4,000 per mile in lieu of State endorsement of bonds, of the various railroad companies of the State, approved April 21, 1873. The bonds authorized by this act have not been but will be issued as soon as received.

Western Maryland.

The last rail on the extension from Hagerstown, Md., to Williamsport was laid November 14th. The extension is seven miles long, and is built mainly for the purpose of reaching the Chesapeake & Ohio Canal and securing some portion of the coal traffic from the Cumberland region. The Cumberland Valley Company has also lately opened a line from Hagerstown to Williamsport. The extension is being graded, and will soon be ready for travel.

North Texas Narrow Gauge.

A company has been organized for the purpose of building a narrow-gauge railroad from Denison, Tex., the junction of the Houston & Texas Central and Missouri, Kansas & Texas roads, southwest through Gainesville and Denton to some point not yet decided on. Application will be made to the Texas Legislature for a charter.

Bangor & Calais Shore Line.

The surveys have been completed and the estimates are being prepared. The line as surveyed starts at Bucksport, Me., the southern terminus of the Bangor & Bucksport road, and runs eastward through Orland, Surry and Ellsworth, crossing Union River at Hopkins Mills; thence it runs through Frank-

lin and Cherryfield, crossing the Narragausus River at Freeman's Mills, and thence through Harrington and Whitneyville to Machias. From that point the road turns northeast and follows the east branch of Machias River to Jacksonville, and thence through Pembroke, along the west bank of Pemasquan River and Lake and through the town of Baring to a junction with the St. Croix & Ponoosbec road, three miles from Calais. The road will be about 120 miles long, and can be built with light grades and easy curves. The bridging will be light, no span over 125 feet being required. A pile bridge, 500 feet long, will be needed at Pleasant River.

Des Moines Valley.

Late dispatches from Des Moines, Ia., state that the motion to set aside the sale of the upper end of the road, from Des Moines to Fort Dodge, was withdrawn, as was also the motion for the removal of the Receiver, Mr. Smythe. The bonds given by the purchasers were transferred to the representatives of the second-mortgage bondholders, who have a first lien on that portion of the road. It is reported that Mr. John E. Henry, who is now in possession of the line from Keokuk to Des Moines, will for the present have the management of the upper end of the line also. Mr. Henry is an engineer by profession, and was for a short time Superintendent of the Chicago & Rock Island and subsequently of the Mississippi & Missouri, now part of the Chicago, Rock Island & Pacific road. He was also Engineer of the Dubuque Bridge.

Boston & Maine.

The Maine Legislature is to be petitioned to pass an act compelling the Boston & Maine and Eastern companies to establish a depot at the crossing of the two roads in North Berwick, Me., and to stop their trains and make connection at that point. This movement is said to be in the interest of the Boston & Maine.

New Mail Route.

An extension of mail service has been ordered over the Cumberland Valley Railroad from Hagerstown, Md., to Martinsburg, West Va., 19 miles.

Northern Pacific.

The commissioners to examine the section of 196 miles (heretofore reported as 200 miles) of this road between the Red River and the Missouri have reported that the road comes up to the requirements of the law and should be accepted.

Ware River.

The track on the extension to Warchendon is now all laid, and a great part of the ballasting is completed. New depots are being put up at ten points on the line. A permanent round-house at Palmer is nearly completed and a temporary round-house at Warchendon is going up. The highest grade on the line is 68½ feet to the mile, and that is only for a short distance. There is no other grade over 50 feet.

Springfield, Athol & Northeastern.

Regular trains will begin running to Springfield, Mass., over this road, December 1.

Vermont & Massachusetts.

It is now stated that all efforts for consolidation having failed, the Fitchburg Company has made a proposition to lease the Vermont & Massachusetts road under a perpetual lease. The terms offered have not been made public, but it is stated that the main points have been agreed upon.

Baxter Steam Canal Boat.

A corporation owning and managing the patent of this boat, of which so much has been said lately, has been organized with the following directors: Hon. H. H. Van Dyck, President; Mr. George Rowland, Secretary; Philo Remington, Milo Sage, N. D. Morgan, William F. Rowland, William Baxter, Frederick M. Peck, Andrew J. Perry, William G. Morgan, G. N. Abeel, George Rowland. Subscription books for the capital stock are open at the New York Loan and Indemnity Trust Company, No. 229 Broadway, and at E. Remington & Sons, No. 281 Broadway, New York.

Baltimore, Pittsburgh & Chicago.

It is stated that work on the grading of this line has been suspended for the winter, partly on account of the severe weather and partly on account of the difficulty which the Baltimore & Ohio Company finds in obtaining currency for its European exchange. Work will be resumed as early as possible in the spring.

It is reported that negotiations are going on for the use of the western part of the line, probably from Defiance, O., by the Chicago & Canada Southern road.

Erie Canal.

The severe weather about November 20 froze over a considerable portion of the Erie Canal. A large number of boats were in the canal, and it was feared that many of them would be obliged to winter where they happened to be caught. It was estimated that about 5,000,000 bushels of grain were in boats on the canal. The New York Central & Hudson River road has offered to take grain to any point east of Utica to New York at 15 cents per 100 pounds delivered at the Thirty-third street depot, or 17 cents per 100 delivered in the harbor.

Later advices, however, report warmer weather and rain, and it is thought that many of the boats will be got out. If the canal is finally closed, it will be the earliest date of closing on record. For 12 years past the canal has not been closed before December 1.

On the 26th the canal was reported finally closed, but only about 1,500 bushels of grain remained on it.

Railroad Matters in Alabama.

The Governor of Alabama, in his recent annual message, states that all the railroad companies concerned, except the East Alabama & Cincinnati, have given notice of their intention of accepting the act to provide for the substitution of State bonds to the amount of \$4,000 per mile, in lieu of State endorsement of bonds, which was approved April 21, 1873, but none of them except the South & North Alabama have taken any further steps.

The Governor recommends the appointment of a Commissioner of Railroads, whose business it shall be to collect statistics of the railroads of the State.

Green Bay & Minnesota.

The grading is completed, but there are several bridges yet to be put up. Track is laid eight miles beyond the late terminus, and only about two miles remains to be laid to reach the junction with the La Crosse, Trempealeau & Prescott road.

Concord.

In the matter of the bill in equity in the case of John H. Pearson against the directors of the Concord Railroad Company, Chief Justice Sargent of New Hampshire has ordered that the injunction restraining the defendants and their employees from placing the company's funds in other than the Treasurer's hands be continued.

Philadelphia & Erie.

A meeting of the individual stockholders was held in Philadelphia, November 22. The committee appointed at the previous meeting reported that they had had a conference with Mr. J. Ed. Thomson, President of the Pennsylvania Railroad Company, who expressed his willingness to surrender the lease of the Philadelphia & Erie for a fair equivalent. A

resolution to commence suit against the Pennsylvania Railroad Company was tabled. It was finally resolved to continue the committee with authority to confer with the lessee on all points at issue and to make such propositions as may be for the best interest of the stockholders, and to report to the stockholders when necessary.

Boston, New York & Chicago.

This new company, which has made a conditional lease of the Lake Ontario Shore road, agrees to raise on the bonds of that company \$50,000 by December 31, \$50,000 more by February 28, 1874, and \$400,000 more by April 1, 1874, the money to be used in completing the Lake Ontario Shore road. It also agrees to pay the latter company 7 per cent. interest on \$7,000,000 as rent. It seems not at all impossible that the lease will not be completed.

Tennessee River Improvement.

During the past year work has been carried on at ten different points on the river between Chattanooga and London, Tenn. The work has been done mainly by hired labor, the contractor having failed. Below Chattanooga, at the Muscle Shoals, a careful survey has been made to determine the exact amount of work required to repair the old canal around Big Muscle Shoals and to extend it around Elk River and Little Muscle Shoals. At Colbert Shoals the channel has been cleared and a dam built from Colbert Island to the Tennessee shore. The amount expended was \$102,000, and it is estimated that \$840,000 can be profitably expended during the ensuing year.

Cumberland River Improvement.

The work on the improvement of this river below Nashville, Tenn., has been confined to the construction of a dam at the mouth of Sycamore Creek and to dredging and excavating rock from the channel between Sycamore Creek and the mouth of Harpeth River. Operations are to be considerably extended during the coming year.

La Crosse Bridge.

The La Crosse Transit Railroad Company has acquiesced in the action of the City Council, which ordered the bonds voted by that city in aid of the bridge across the Mississippi to be cancelled, in consequence of the failure of the company to begin work within the specified time. A question is raised, however, as to the right of the City Council to cancel the bonds after the people had voted to issue them. The bonds are in the hands of a trustee.

Central Branch Union Pacific.

In the New York Supreme Court, November 25, Judge Barrett refused to confirm the appointment of Richard H. Bowne and Benjamin C. Wetmore as trustees for the first-mortgage bondholders. The judge held that while Messrs. Bowne and Wetmore were in other respects competent and proper persons, their relations, both by blood and in business, with the officers of the company were such as to unfit them for a position which requires perfect impartiality as between the company and the bondholders.

Logansport, Crawfordville & Southwestern.

The financial agents of this company give notice to the holders of its bonds that the coupons which were due November 1, and were not paid, will be paid February 1, 1874, together with the coupons which will mature at that date.

Old Colony.

At the annual meeting in Boston, November 25, the stockholders by a nearly unanimous vote confirmed the action of the directors in securing a controlling interest in the stock of the Middleboro & Taunton Railroad Company. The directors were also authorized to purchase the controlling interest in the stock of the Fall River, Warren & Providence Company, and to establish a through line of railroad between Fall River and Providence, in connection with the Boston & Providence Company. It was also resolved that it is expedient for the company to control steamboat lines running in connection with the road to New York and points in Vineyard Sound, and the directors are authorized to take all necessary steps for the establishment and control of such lines. Finally the stockholders voted to authorize an issue of 7 per cent. bonds having not more than 20 years to run, to an amount not exceeding the present debt of the company, for the purpose of funding all the existing bonded and floating debt.

New York Central & Hudson River.

The committee of locomotive engineers have had one or two interviews with Mr. W. H. Vanderbilt, Vice-President of the company, but the question of reduction of wages has not been definitely settled.

Delaware, Lackawanna & Western—Morris & Essex Division.

The Morris & Essex Company gives notice that it will apply to the Legislature of New Jersey for a supplement to its charter authorizing it to establish and maintain a ferry across the Hudson River.

Poughkeepsie Bridge.

The plans have been completed and the maps of the land approaches have been prepared for filing in the State Engineer's office. The bridge, as already stated, will have five spans of 500 feet each, and the track will be nearly 200 feet above the river. From the eastern end of the bridge to Washington street in Poughkeepsie the road will be carried on a succession of short spans, and from Washington street to the junction with the Poughkeepsie & Eastern road by an embankment. Work is to be commenced on the shore piers and the approaches at once. Mr. P. P. Dickinson will have immediate charge of the work.

Railroad Mail Routes.

From the annual report of the Postmaster General, it appears that the whole length of railroad mail routes is 63,457 miles. The annual transportation was 65,621,445 miles, and the cost \$7,257,196, or about 11.06 cents per mile. The increase in length of routes was 5,546 miles and in cost of \$754,425, against an increase during the previous year of 8,077 miles in length and \$777,792 in cost. The whole length of steamboat routes was 16,762 miles, the annual transportation 3,947,785 miles and the cost \$793,645, an average of 20.25 cents per mile.

Gilman, Clinton & Springfield.

In the suit of stockholders at Bloomington against some directors, complaining that the latter had made contracts on unreasonable terms for the construction of the road with the Morgan Improvement Company and for the transportation of fuel with the Barclay Coal Company, which two companies were wholly controlled by said directors, the court has found in favor of the complainants, and decided to appoint a Receiver to take charge of the road until it can be ascertained who the legitimate stockholders are, and to whom the possession of the property should be given.

Portland, Saco & Portsmouth.

A suit is pending in the United States Circuit Court at Boston against the Boston & Maine Railroad Company to recover a balance of \$125,000 received by it for earnings over the Portland, Saco & Portsmouth when that road was worked by the Boston & Maine and the Eastern jointly, and alleged to be now due the Portland, Saco & Portsmouth.

